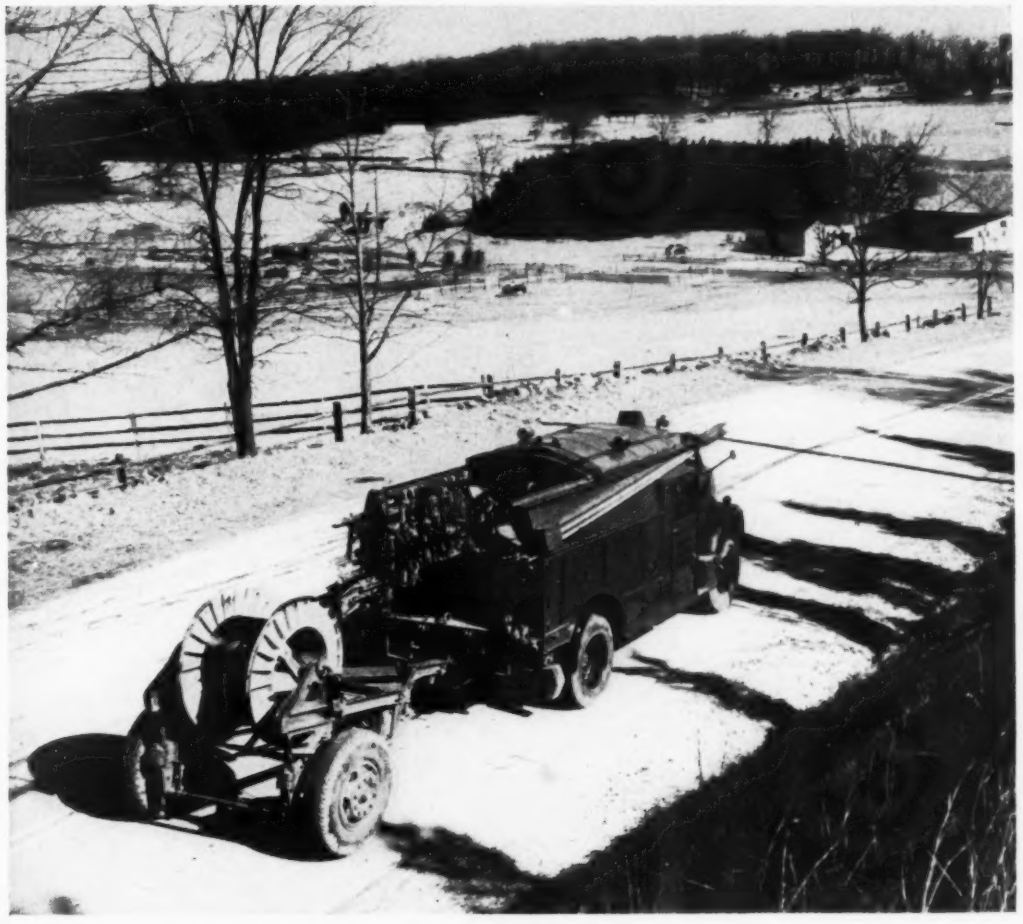
DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

FEBRUARY 9, 1957
VOL. 152—NO. 6

# Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



## A HEAP OF TRUCKS

It is estimated that the telephone industry operates 70,000 trucks of all sizes to maintain and construct the nation's telephone systems—part of the huge investment made to meet the communications needs of America.

Published every week on Saturday by TELEPHONY PUBLISHING CORP. 305 S. Dearborn St., Chicago 5, Ill. Subscription $4.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

Guaranteed Circulation This Issue
11,606 of Which 11,060 is Paid

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

XUM

TAILORED

## ED for your "in-between" customers . . .

# F-80 "XY"® 80-LINE PBX

Here is a system well suited to your business, industrial and institutional subscribers who are too big for the 40-line F-40 PBX—but not big enough for a selector-type system:

1. The F-80 PBX provides 80 lines, 14 talking paths, 10 central office trunks and 4 information trunks. It is wired for night answering service.

2. The system provides single party service, restricted and "executive-right-of-way" service, and conference and code call facilities.

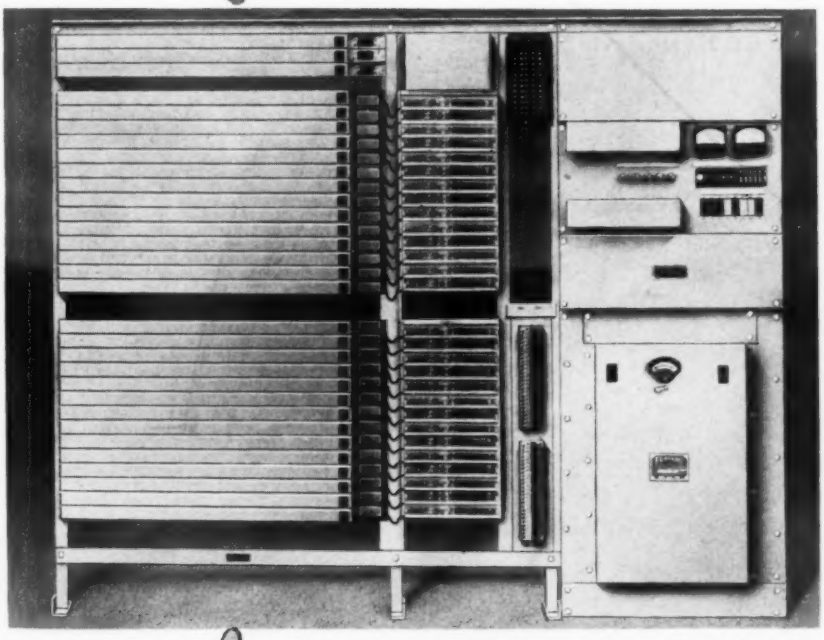
3. The Stromberg-Carlson F-80 PBX is furnished with cord-type attendant's cabinet in smart, modern styling. Additional positions can be easily installed.

Here's your opportunity to open up profitable *new* channels of revenue. Your nearest Stromberg-Carlson office will gladly supply descriptive literature and hard-hitting sales aids.

**STROMBERG-CARLSON COMPANY**

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco



All switching equipment for the F-80 PBX is contained in a single compact equipment bay. Its approximate dimensions are 6 feet high, 7 feet wide, 1 foot deep.

The smartly styled modern cabinet requires no cable turning section. If more than one attendant's position is needed, it is easily installed.

# FLASHES AND PLUGS

**SUBSTITUTE SPEAKER.** The unit chairman of a Milwaukee, Wis. cub scout pack recently had to telephone a den mother on pack business.

He got the cub of the family, Peter, on the telephone, who told him that his mother was not at home. The call gave Peter an opportunity, however, to ask for a preview of the next pack meeting.

"Going to have anybody special?" Peter asked.

"Right now," quipped the pack chairman, "I am trying to get President Eisenhower for our next guest speaker."

There was a troubled pause, then . . .

"Well, I guess that probably would make a good program, but I'd rather have Eddie Mathews," Peter said.

•

**SPIRIT OF ADVENTURE.** Does the average American breakfast ever strike you as having a certain sameness?, queries AT&T's *Long Lines*. If so, we are glad to recommend the Egyptian variety. There, the first meal of the day often consists of fool mudammas, baid, khobz, gubn, murabba, zaitoun and laban gamoos.

Translated into more understandable terms this means: beans cooked in butter, an egg, bread, cheese, black olives and buffalo milk—in that order.

On the other hand, the Norwegian version might be more to your taste. This includes: havregot (oatmeal porridge), kokt egg (eggs cooked in shell), sardiner (sardines), knekkebrod (hard tack), smor (butter), gjetost (goat's milk cheese), marmelade (marmalade), and melk og kakao (milk and cocoa).

On thinking it over, we'll just stick to our usual three-minute egg, orange juice, toast and coffee.

•

**PUSSY WANTS A CORNER.** A Glendora, Cal., man had his new house fluoroscoped on Jan. 26 in a desperate "last resort" to find the cat that had been meowing in the walls for three weeks, but the house was still purring when the United Press reported the story on Jan. 28.

A police x-ray technician went over every inch of every wall, without picking up the telltale image of a cat's skeleton. He heard purring, though.

The interloper apparently crawled into the dark recesses of the $20,000 house some 21 days previous, when a telephone installer cut a hole in a wall. The cat had been purring off and on night and day, ever since.

Mr. Carta, his wife, and their two young children finally went to church to pray for a way out of their plight.

"We can't stand it any more," the family said. "The meowing is driving us crazy."


**CIRCULATION**

**Guaranteed circulation of this issue is 11,606, of which 11,060 is paid.**



# Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

*Since 1901*

**February 9, 1957**


CONTENTS


IN THE NATION'S CAPITAL ..... 17
*By Francis X. Welch*

3-DIMENSIONAL ENGINEERS ..... 20
*By Frederick R. Kappel*

THE PLANT MAN'S NOTEBOOK ..... 26
*By Ray Blain*

PLANT MAN'S QUIZ ..... 28
*By Ray Blain*

TELEPHONY'S PBX SERVICE ADVISERS' HANDBOOK ..... 30
*By Gilbert R. Brackett*

SMALL TELEPHONE COMPANIES UNDER THE FEDERAL WAGE-HOUR LAW ..... 34

THE OPERATOR'S CORNER ..... 38
*By Mayme Workman*

COURTS AND COMMISSIONS ..... 45

1957 CONVENTION CALENDAR ..... 48



H. D. FARGO, Jr., *President & Advertising Manager*
R. C. RENO, *Vice President & Editor*
H. D. FARGO, *Vice President & Treasurer*
A. J. STULTS, *Secretary & Western Manager*
DAN S. FARGO, *Managing Editor*
FRANCES E. CRETCHER, *Associate Editor*
RAY BLAIN, *Technical Editorial Director*
HAROLD B. McKAY, *Electronics Editor*
FRANCIS X. WELCH, *Washington Editor*
MAYME WORKMAN, *Traffic Editor*
VIVIAN RYDEN, *Circulation Manager*

WESTERN REPRESENTATIVES:

**McDonald-Thompson, San Francisco, Cal. Also offices in Los Angeles, Seattle, Houston, Tex.; Tulsa, Okla., and Denver, Colo.**

Vol. 152, No. 6. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago 5, Ill. 25c per copy (except special issues—40c). Subscription $4.00, 1-year; $6.50, 2-years; $8.50, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries.

**Telephone WA bash 2-2435**

# FWD doesn't skip the tough jobs ...works anywhere in any weather

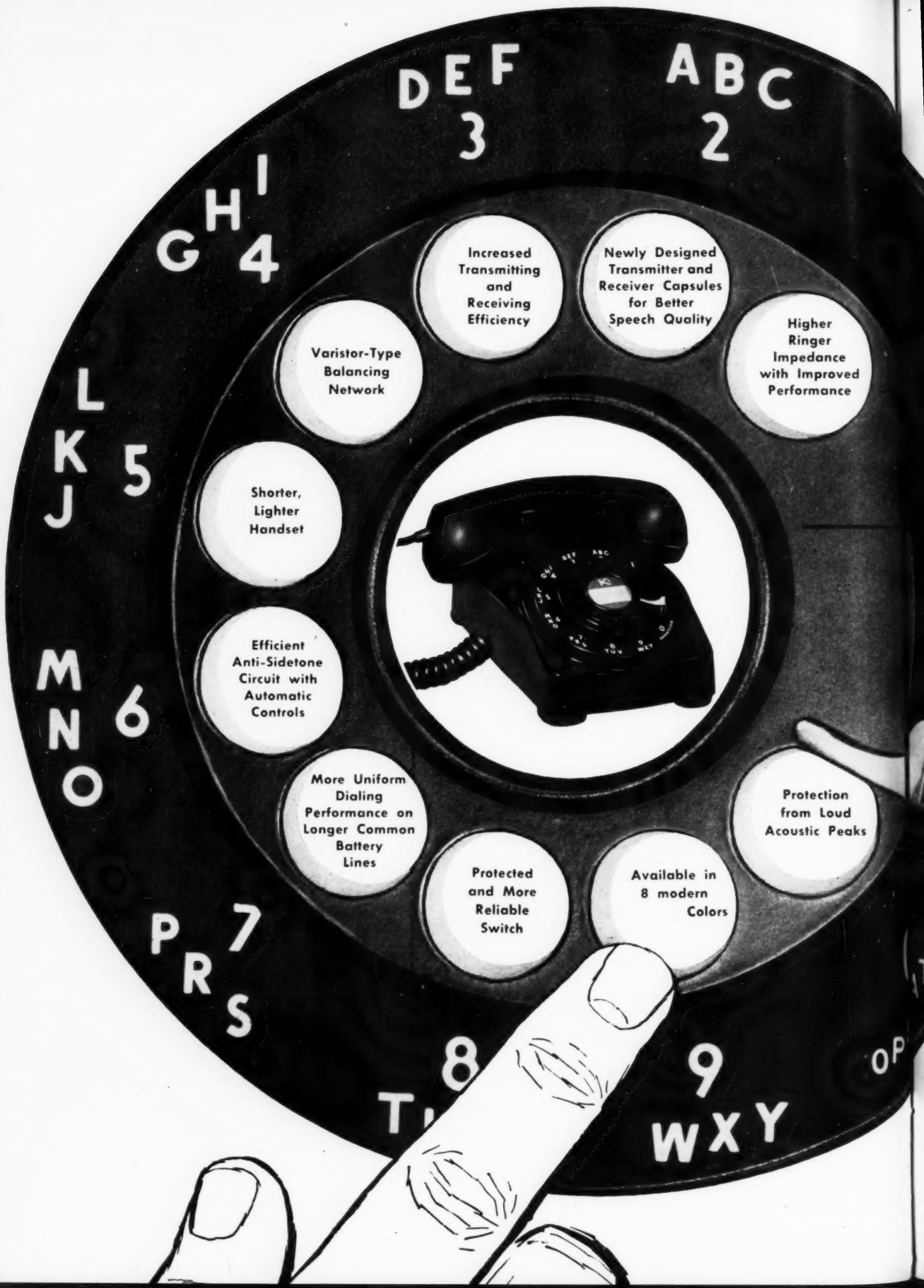
When the shortest distance between two pole jobs is cross-country . . . you need FWD! New FWDs save time because you don't have to look for the level, easy way to get there. With FWD's unmatched power and traction you can travel straight to the job and do it, no matter how tough the terrain or weather. FWD is the only truck that is ready for line trouble emergencies—anywhere, anytime!

There's an important difference built into FWDs. They have full time, *true* four or six-wheel drive with both power *and* weight proportioned to each driving axle. This is the only way you are assured that every pound of weight is utilized to produce the kind of tractive power that doesn't skip the tough jobs . . . works anywhere in any weather!

FWD

***Heavy-Duty Vehicle Specialists***

**THE FOUR WHEEL DRIVE AUTO COMPANY** · **Clintonville, Wisconsin** · *Canadian Factory* · Kitchener, Ontario


DEF 3
ABC 2
GHI 4
JKL 5
MNO 6
PRS 7
TUV 8
WXY 9
OPER
Increased Transmitting and Receiving Efficiency
Newly Designed Transmitter and Receiver Capsules for Better Speech Quality
Higher Ringer Impedance with Improved Performance
Varistor-Type Balancing Network
Shorter, Lighter Handset
Efficient Anti-Sidetone Circuit with Automatic Controls
More Uniform Dialing Performance on Longer Common Battery Lines
Protection from Loud Acoustic Peaks
Protected and More Reliable Switch
Available in 8 modern Colors

# YOU CAN PUT YOUR FINGER ON THE THINGS THAT MAKE THE KELLOGG K-500 OUTSTANDING

Ten good reasons why the Kellogg K-500 Telephone is well worth your immediate attention. Not just vague generalities, but important, concrete advantages that automatically mean better service for your subscribers, and savings in maintenance and repair costs for you. Each advantage will be instantly apparent to you upon your very first demonstration—vast improvement in speech quality . . . uniform transmission, reception and sidetone . . . better transmission, dialing and ringing performance on much longer common battery lines. And then there's that wonderful plus-value of being able to offer your customers a choice of eight, two-tone decorator colors!

There's a detailed explanation of all these advantages in the interesting and informative K-500 Bulletin. A Free Copy is waiting for you now. Just drop us a note and we'll give your request immediate attention.

KELLOGG
A DIVISION OF I T & T

**KELLOGG SWITCHBOARD AND SUPPLY COMPANY**
*A Division of International Telephone and Telegraph Corporation*
SALES OFFICE: 79 WEST MONROE STREET, CHICAGO 3, ILLINOIS
PHONE: DEarborn 2-0750
**Warehouses:** Chicago 38 • Kansas City 1 • Mansfield, Ohio • St. Paul 4 • Dallas 2 • Burlingame, Cal. • Atlanta, Ga.
**Export:** International Standard Electric Corporation, New York 7, N. Y., U. S. A.

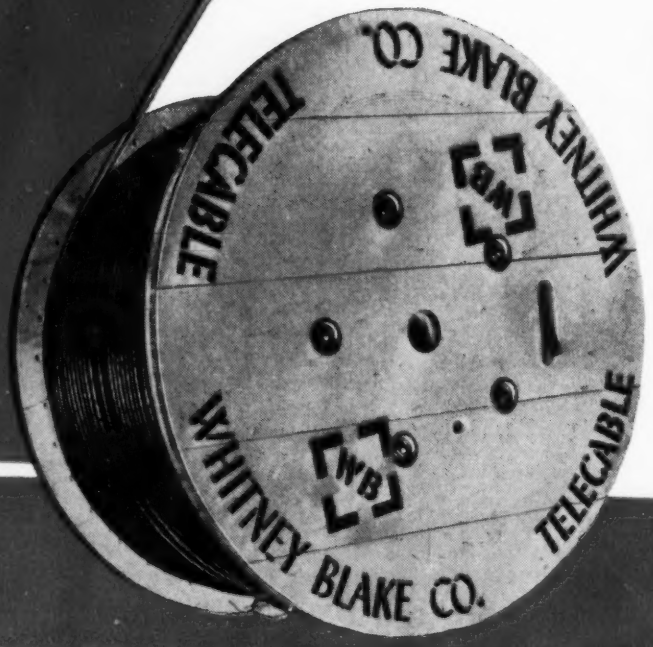
# Buy Right Now and . . .

# SAVE for YEARS

WITH WB

# TELECABLE®

## THE STANDARD FOR QUALITY AND SERVICE




WB has that which others have yet to gain . . . EXPERIENCE

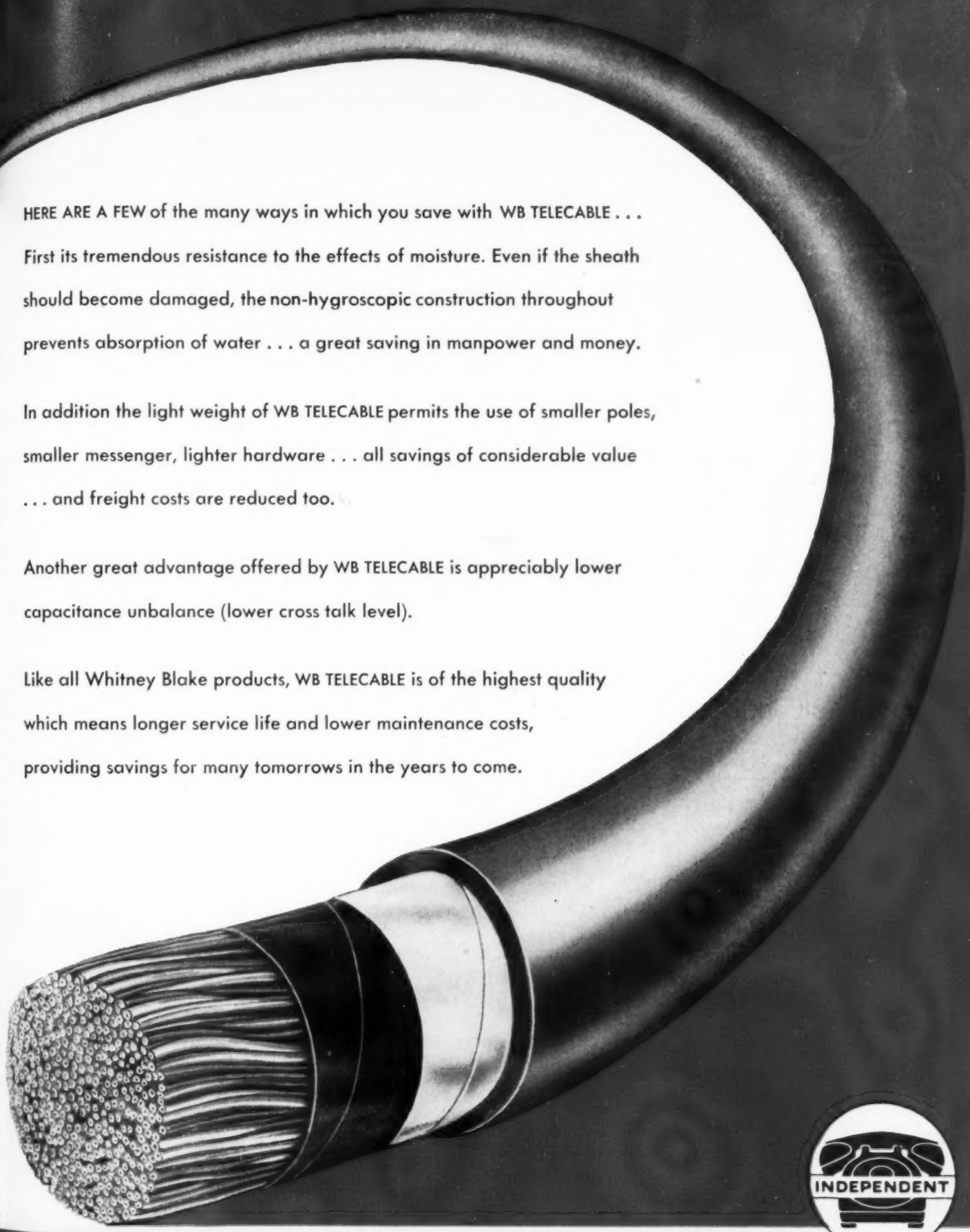
XUM

HERE ARE A FEW of the many ways in which you save with WB TELECABLE . . .
First its tremendous resistance to the effects of moisture. Even if the sheath should become damaged, the non-hygroscopic construction throughout prevents absorption of water . . . a great saving in manpower and money.

In addition the light weight of WB TELECABLE permits the use of smaller poles, smaller messenger, lighter hardware . . . all savings of considerable value . . . and freight costs are reduced too.

Another great advantage offered by WB TELECABLE is appreciably lower capacitance unbalance (lower cross talk level).

Like all Whitney Blake products, WB TELECABLE is of the highest quality which means longer service life and lower maintenance costs, providing savings for many tomorrows in the years to come.



INDEPENDENT

Well Built Wires Since 1899

©1957

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

XUM

# DID YOU EVER

## see 3 nicer PABX installations?

They're by the Middle States Telephone Company of Illinois

The equipment is by LEICH

Park Ridge and Des Plaines are two of Chicago's "growingest" suburbs. The many business firms moving to these towns provide great telephone revenue opportunities for the Middle States Telephone Company which serves these two towns.

Middle States chose the Leich Dial System as the most practical and efficient way to furnish modern PABX service to these new business customers shown here.

**WHY LEICH?**

The Leich Dial System with its all-relay operation is ideal for PABX installations. It requires very little maintenance, takes a minimum of space, operates quietly and efficiently for long periods without any attention.

With the Leich Dial System your PABX customers can have their choice of every desirable service feature. There's ample capacity for main exchange, foreign, information and tie trunks.

Attractive floor type or keyset attendant's cabinets can be furnished to customers specifications.

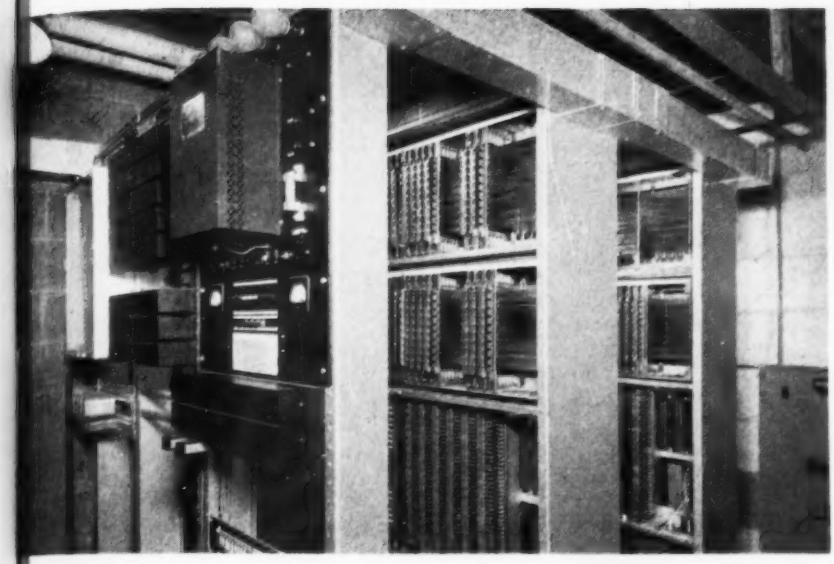
From the telephone company's standpoint, this is a practical investment. For with the Leich Dial System you can quickly and inexpensively add lines or links by jacking them in on the switchboard.

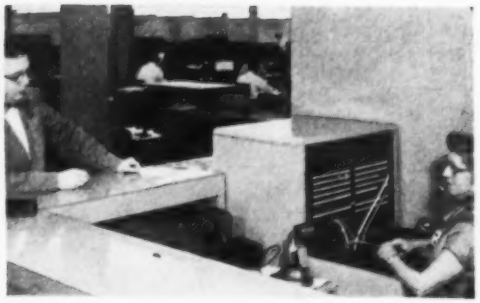
If there are any PABX prospects in your territory, we shall be glad to quote you on a Leich Dial System PABX.

There's no charge or obligation. Let's hear from you.

**LEICH**

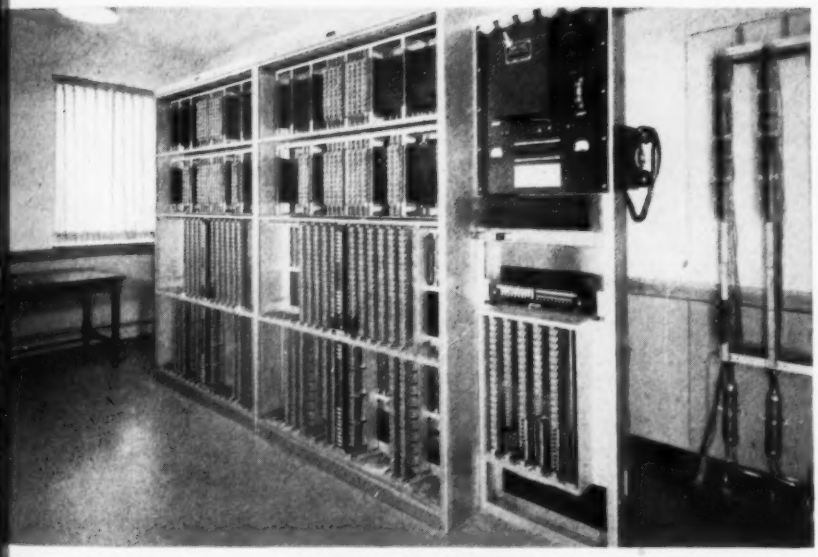
LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6, ILL.





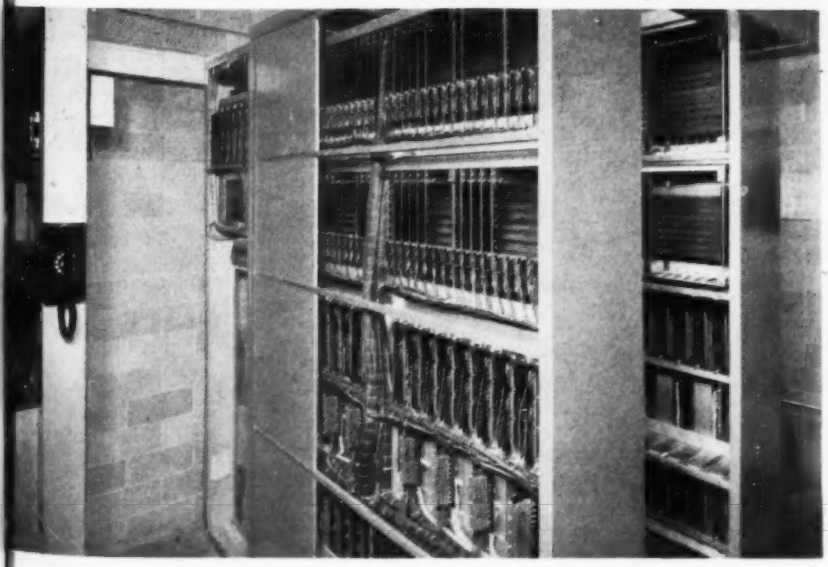
## BUTLER BROTHERS

140 lines, 18 trunks, 16 links, single position attendant's switchboard. The Leich Dial System is wired for 200 lines.



## GENERAL MILLS

100 lines, 24 trunks, 16 links, two position attendant's switchboard. Wired for 200 lines.



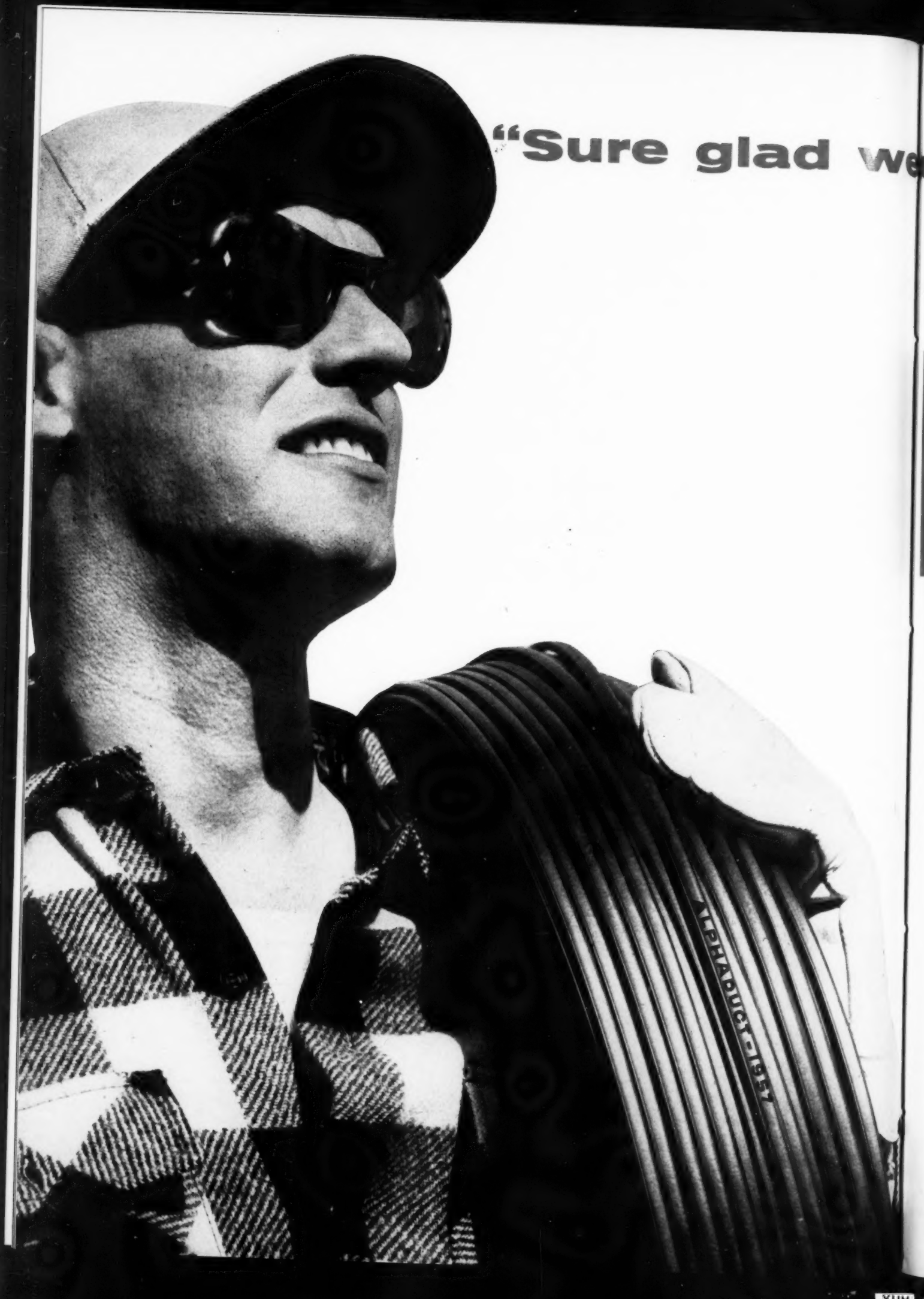
## FASTEX DIVISION
### ILLINOIS TOOL WORKS

100 lines, 14 trunks, 10 links, single position attendant's switchboard. Wired for 200 lines.

**C** Manufacturers of telephones, switchboards and related apparatus since 1907

6, ILL PACIFIC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CALIFORNIA SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

GENERAL TELEPHONE SYSTEM


"Sure glad we
ALPHABUCKSHOT

# ...used Alphaduct Drop Wire...

## ...There's *one* job we'll never have to worry about"

That's right. Alphaduct means worry-free drops, in any lineman's language!

Alphaduct is designed to be the longest-lasting drop wire you ever put up. It's quality-made, and each type of Alphaduct is rigorously tested for built-in durability.

For instance, every day a random production sample of Alphaduct drop wire is put into a "P" clamp, and stretched—and *stretched*. In this test, there must be NO slipping of the jacket or the insulation, before the conductor finally breaks.

Then, there's the Insulation Compression test: pieces of Alphaduct are slowly crushed between two steel plates. Each conductor of Alphaduct twisted-pair must withstand a 1000-pound pressure—and parallel drop wire insulation must resist 1500 pounds of pressure before it breaks. Here is your assurance that Alphaduct won't slip through your fittings—and it won't be hurt when you clamp it *tight*.

Alphaduct gives you other advantages, too. The easy-handling carton keeps it orderly, down to the last foot. And Alphaduct is *dated* so that, years from now, you'll see how long it stayed up. All the way 'round—Alphaduct *saves you money*.

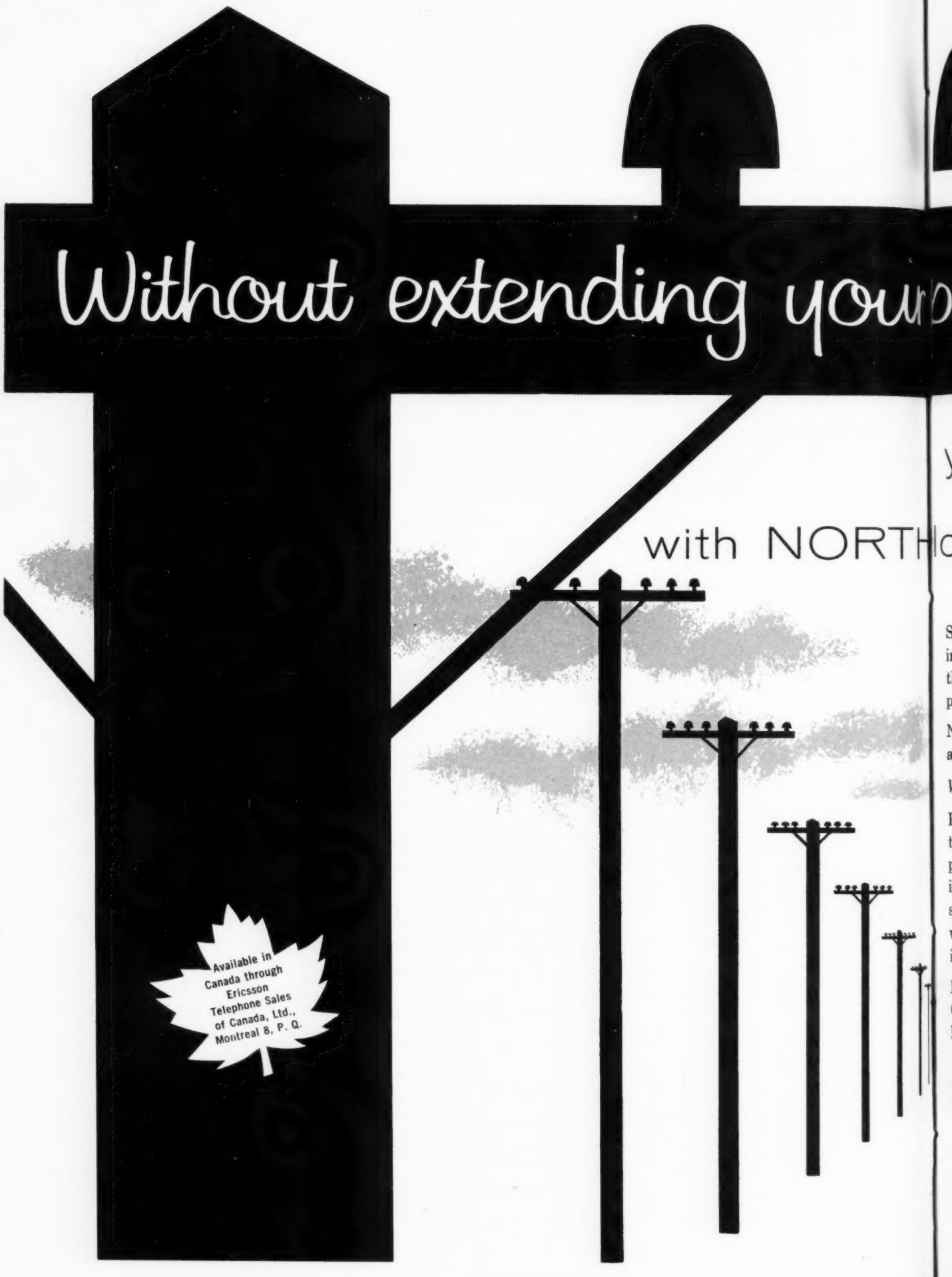
Make sure you have enough Alphaduct on hand...call Automatic Electric today. We have Alphaduct wires right in our warehouses—part of the speedy Supply service you'll always get by calling your A. E. representative or your nearest Automatic Electric Sales Corporation warehouse.

**Automatic's 5 friendly warehouses:**

| | | | | |
|---|---|---|---|---|
| George Ferguson, Mgr.<br>1033 W. Van Buren St.<br>Chicago 7, Ill.<br>HAymarket 1-4300 | "Michie" Hester, Mgr.<br>2915 Moore St.<br>Richmond 21, Va.<br>Tel. 6-9280 | Ed. J. Chok, Mgr.<br>2360 N. W. Quimby St.<br>Portland 10, Ore.<br>CApitol 3-7244 | Fran Batcher, Mgr.<br>158 Corliss Avenue<br>Johnson City, N. Y.<br>Binghamton 7-8507 | Gene Martin, Mgr.<br>2021 Main St.<br>Kansas City 8, Mo.<br>HArrison 1-4720 |

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE


Without extending your
with NORTH
Available in Canada through Ericsson Telephone Sales of Canada, Ltd., Montreal 8, P. Q.

# ...physical lines...

## you can extend your service

## TH low cost SUBSCRIBER CARRIER

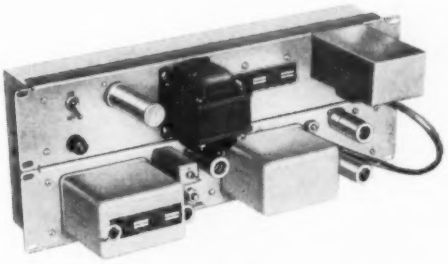
Service to the community has always been the keynote of the telephone industry. Yet today many Independent Companies, anxious to meet the ever increasing pressures for extended service, are faced with the problem of heavy expense incident to the construction of physical lines.

North Low Cost Subscriber Carrier has been specifically engineered and built to overcome this obstacle.

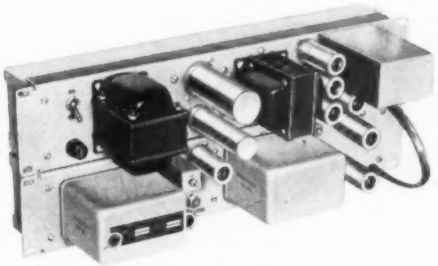
*With North Subscriber Carrier you can:*

Provide service for waiting list customers adjacent to lines now filled to capacity; reach potential customers beyond the end of present lines; provide private, two-party, or four-party lines not now available, with improved rate earnings; free physical circuits for pay stations and other special revenue services; meet demands for special temporary service, where carrier can be moved to meet changing requirements; and offer improved service to customers now on overcrowded lines!

Let your NORTH representative show you how NORTH Subscriber Carrier can do all this for you at a substantial saving over physical line construction.



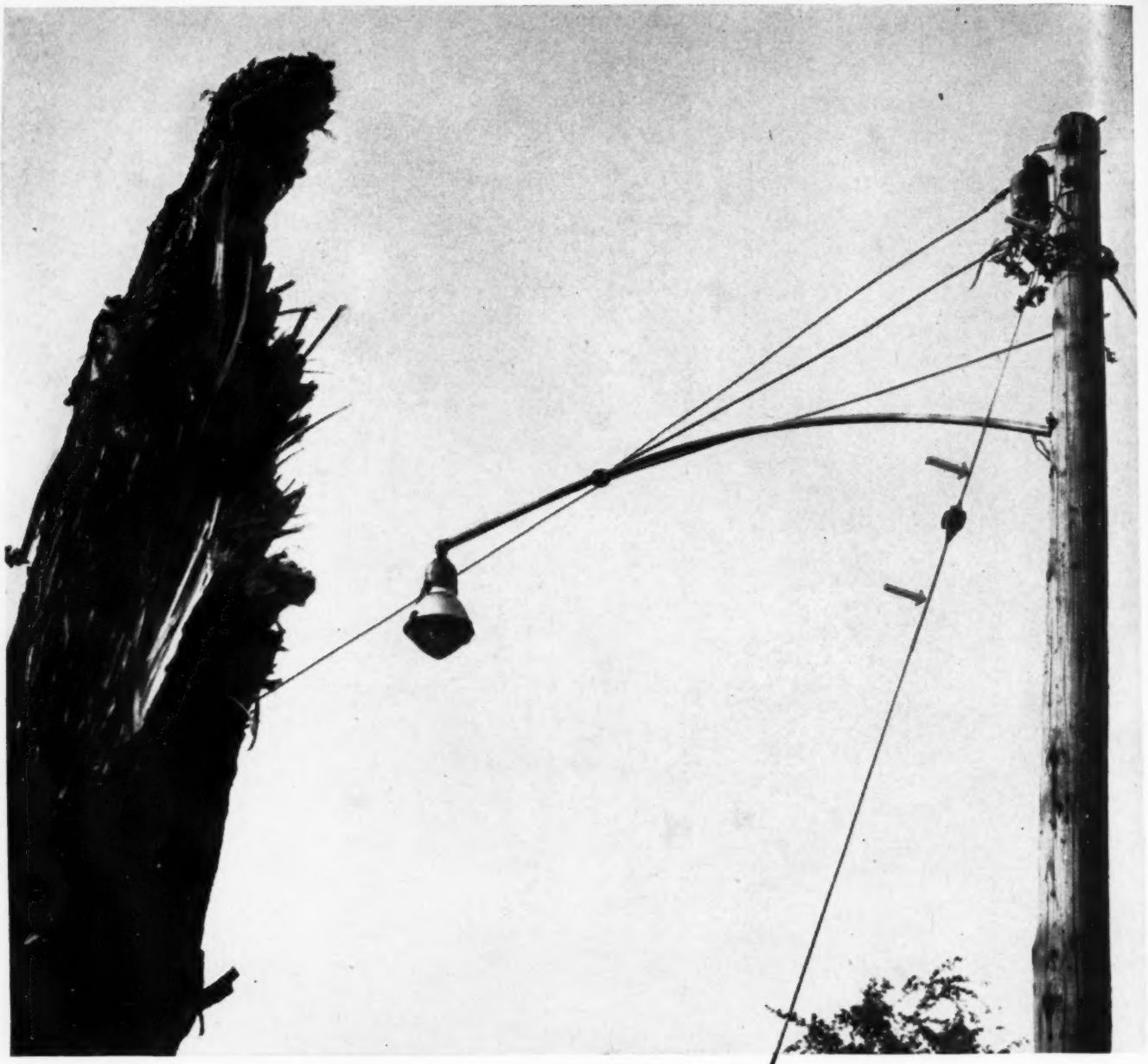
CENTRAL OFFICE TERMINAL



DISTANT TERMINAL

**NORTH ELECTRIC COMPANY**

**601 SOUTH MARKET STREET • GALION, OHIO**



# 75 - 100 MPH Wind Rips off Tree

# PLP *GUY-GRIP* Dead-Ends Stand Firm

Nature provided the test. Hurricane-strength winds—75 - 100 miles an hour—snapped off the top half of a huge elm tree ... and hurled it against both pole and guy. After the debris was removed ... the picture told its own dramatic story. Here's graphic evidence that today's best answer to any guying problem ... subjected to any kind of condition ... is PLP Guy-Grip dead-ends.

Dept. No. TR2A

*Made in accordance with or for use under U. S. Patent No. 2,761,273; other patents pending.*

PX – 77

**PREFORMED LINE PRODUCTS COMPANY**

5349 St. Clair Avenue — Cleveland 3, Ohio

TELEPHONE: CLEVELAND EXPRESS 1-3571

# IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

**Indiana commission recognizes diminishing purchasing power of dollar in accruing for depreciation. Life insurance companies have met more than one-half of long-term financing of public utilities in recent years. New Jersey Supreme Court rules unclaimed deposit belongs to electric company.**

FOR A NUMBER of years some public utility people have been complaining about regulation falling into the hands of the "bookkeepers." By that they mean the ultra orthodox accountants who think that rigid statements and regulatory application of original cost are more important than changing economic facts, instead of vice versa. It is something like confusing the function of the thermometer with the state of the weather.

But, so strong has been the "accounting first" school of public utility regulation, that comparatively few utility companies have even dared to do anything about it. This is particularly so in the realm of charges for depreciation. For several years public utility officials have watched the prices of replacement of worn-out or depreciated plant steadily rise as the purchasing power of the dollar dropped after World War II. Efforts were made to gain some recognition of this declining purchasing power of the dollar by having the depreciation charge trended or adjusted or otherwise treated so as to bring it more in line with economic reality. Several attempts were made in Bell System rate cases, particularly in the southern states. They failed. A valiant attempt to do something about this was made by the Peoples Gas Light & Coke Co. in a rate case before the Illinois commission in 1952, with only limited success.

Such activity brought forth indignant complaints from the "bookkeepers" that the utility people were tampering with the thermometer again. They wanted to ignore the economic weather altogether. What difference would it make, asked the "bookkeepers," if the worn-out equipment had to be replaced at higher prices? After all, the higher prices would go into the rate base at original cost. But, this view overlooks the economic justice of making each generation of ratepayers pay for the expense of that part of the utility property which is worn out in *their* service—instead of passing the bill on to some future generation of ratepayers to pay; and then having them pass their depreciation bills on, in turn, still further into the future.

All this is by way of background for a rather courageous decision of the Indiana Public Service Commission which on Jan. 11 granted a $353,500 rate increase to the Indiana Telephone Corp. The fact that the commission, in an opinion by Chairman Warren Buchanan, used a fair value rate base is not exceptional, because that has been the rule in Indiana for some years. The real reason why the Indiana Telephone Corp. case is a "trail blazer" is the recognition, at least, of the diminished purchasing power of the dollar in accruing for depreciation. This means a frank and open departure from the original cost basis of depreciation accrual—the most sacred bastion in the whole framework of the original cost theory of public utility rate regulation and accounting. In a word, here is what Chairman Buchanan's opinion authorized the Indiana Telephone Corp. to do:

". . . authorized to accrue depreciation upon the basis of the cost of its property, repriced in current dollars; and file its annual report with this commission showing depreciation expense accrued on the basis of original cost and on the basis of cost repriced in current dollars. . ."

How did all this come about? The main reason seems to be not only a good deal of pluck and persistence on the part of the management of the Indiana Telephone Corp. (which for the last two years has been recording current value as an alternative statement in its financial reports to stockholders). It was also the result of good sound rate case preparation. The Indiana company brought up some "big guns." There was the testimony of one of the most distinguished and respected authorities in the field of accounting, Dr. William A. Paton, professor of the University of Michigan. Another distinguished witness was Dr. John K. Langum, professor of Business Administration, Indiana University. There were also the well-known Indianapolis engineer, Earl L. Carter, and some able assistants.

Here is one thing Professor Paton had to say about the results of corporate statements which are prepared without regard to changes in dollar value:

"The general effect on corporate financial statements, prepared without regard to the change in the value of the dollar, has been understatement of the actual cost of operation and overstatement of net earnings. The major points at which the ordinary income computations have been invalid are the cost of materials and supplies consumed and the cost of plant consumed. The error is especially marked in the case of plant cost."

Paton went on to point out that the impact of the changing dollar has been tremendous in the utility field because of the vast amount of investment and the long life of the assets. What would he do about it? The Indiana commission opinion quoting from Paton's testimony states:

"In the determination of the cost of plant consumed in utility operation, the varying dollars of investment reflected in the successive generations of plant installed should be converted by an ap-

propriate index to current 1956 dollars, so that this important cost may be accurately measured in the same kind of dollars as are represented in the revenues being collected from customers. It is impossible to contradict the fact that one 1956 dollar received from a customer is not the equivalent of, and does not represent the recovery of, one 1940 dollar of plant consumed."

The Indiana commission referred to Paton's references to the 50 per cent drop in the value of the dollar since 1940, which means that the cost basis of accounting should continue to be used, but with the important modification that *original cost dollars should be converted to a single common denominator in terms of current dollars.* In its finding, the Indiana commission raised this significant conclusion with respect to depreciation:

"Depreciation is as much a cost of doing business as wages and salaries and other obvious operating expenses; depreciation is the cost of plant or property consumed from day to day in the production of services sold by a utility. Depreciation, or the cost of plant consumed, measured in current dollars, and related to other factors as was done in the evidence presented herein tends to reflect a realistic picture of profits in which there is no understatement of cost or overstatement of profits."

### *Life Insurance Investments*

It might surprise a good many people in the public utility business to realize what extent life insurance companies have assisted in financing their new plant and plant expansion programs in recent years. Considering the three main utility groups (electric, telephone, and gas, in the order of investment), the life insurance companies have met more than half of the long-term needs of these public service industries in the United States.

The authority for this is the Institute of Life Insurance, which compiles data along these lines for periodic reports. This means that every reader of these lines who owns a life insurance policy, or takes out a new policy, is probably investing through that policy, to a large extent, in the financing of public utility operations, including telephone companies.

At the start of last year (1956), of the $13,968,000,000 public utility bonds held by the United States life companies, $13,537,000,000 were bonds of United States corporations. This represents an investment of $130 per policy holder. The total funded debt of these utilities was just under 25 billion dollars.

The most recent report of the Institute of Life Insurance analyzes these

## REA Makes Three Telephone Loans Totaling $2,371,000

**The Rural Electrification Administration made telephone loans in the amount of $2,371,000 to borrowers in three states during Jan. 21 to 25, the U. S. Department of Agriculture announced on Jan. 29.**

**The Indiana and Oklahoma loans will enable the borrowers to furnish improved service to 1,927 present subscribers, and initial service to 711 families. The North Dakota borrower will use its current loan along with a prior loan to furnish new and improved service to about 5,200 subscribers. Details of the loans follow:**

**Batesville Ind. Telephone Corp., $1,140,000, first loan (Jan. 22).**

**The borrower plans to use these funds primarily to furnish improved service for 1,719 existing subscribers and initial service for 210. Existing subscribers include 118 families who now own their lines and receive switching service from the adjacent Morris Telephone Co. whose facilities the Batesville corporation plans to acquire.**

**In addition, the Batesville company will extend initial service to 483 subscribers located in its Holton, Milan, Osgood and Versailles exchanges, all of which have recently been converted to dial operation.**

**An automatic central office and headquarters building will be constructed in Batesville.**

**A portion of the REA funds will be used for refinancing existing indebtedness of the borrower.**

**The Batesville company owns 156 miles of its own toll facilities, and has commercial offices in each of its exchange areas except Holton. The borrower already provides dial service to 2,313 subscribers.**

**W. J. Scheidler is president and C. R. Gannon is manager of the Batesville Telephone Corp.**

*

**Pioneer Telephone Cooperative, Kingfisher, Okla.; $137,000, fourth loan (Jan. 22).**

**The cooperative proposes to use these funds to furnish improved service for 208 existing rural subscribers and initial service for 18 farm families. As a nucleus, the borrower plans to acquire the properties of the Drummond Telephone Co. now providing magneto service over 71 miles of line.**

**Present plans include a new automatic central office building in Drummond.**

**The four REA loans to the Pioneer cooperative total $1,193,000 and will enable it to provide modern dial service to 2,371 rural subscribers. The system will consist of 992 miles of line. Of the proposed nine exchange areas, Fay, Geary, Loyal and Oakwood are now in operation. The remaining exchanges will be located at Ames, Calumet, Cleo Springs, Omega and Drummond.**

**T. W. Bailand is president and Roy C. Boecher is manager of the Pioneer cooperative.**

*

**Polar Rural Telephone Mutual Aid Corp., Petersburg, N. D. (temporary mailing address: Grafton, N. D.; $1,094,000, second loan (Jan. 25).**

**The borrower plans to use this loan, together with the first loan of $2,309,000, approved in October 1953, to provide service for the first time to 1,809 subscribers, and improved service for 3,413 subscribers.**

**Eighteen automatic exchanges will be located at: Arthur, Bathgate, Bowesmont, Cavalier, Crystal, Dahlen, Drayton, Edinburg, Galesburg, Heche, Hoople, Hunter, Inkster, Michigan, Niagara, Park River, Petersburg and St. Thomas.**

**In addition to properties acquired in connection with the first REA loan, the borrower has acquired or plans to acquire the following telephone facilities: Ryan Telephone Co. at Inkster; Dahlen Telephone Co.; Edinburg-Gardar Telephone Co.; Galesburg exchange of the Traill County Telephone Co. at Hillsboro; and two small switcher lines in the vicinity of St. Thomas. All of these telephone properties are now furnishing magneto service.**

**At a later date, the borrower plans to construct a combination automatic central office and headquarters building at Park River.**

**Irvin M. Hanson is president and John G. Walters is manager of the Polar Rural Telephone Mutual Aid Corp.**

bond holdings of the life companies as of Jan. 1, 1956, by type of operation. According to this report, the life company holdings of all telephone and telegraph company bonds (as of that time) amounted to nearly 2.5 billion dollars and probably exceeds that amount today. The exact figure given in the institute's report of Jan. 1, 1956, was $2,434,000,000.

As for the bond holdings in other types of utilities, $7,415,000,000 represented funded debt of electric light and power companies in the United States. Gas utilities and natural gas pipelines in the United States counted for $3,160,000,000 of the life company utility bond holdings. The gas pipelines' bonds alone totaled $1,884,000,000, while the bonds of other gas utilities — mainly local distributing companies—amounted to $1,276,000,000. Scattered among other kinds of utilities—private water, local transit, and a few other miscellaneous enterprises qualified as public utilities—the life company bond holdings amounted to 528 million dollars.

The investment by the United States life insurance companies also extends to utility enterprises in foreign countries, chiefly Canada. As at the start of last year, these foreign bond holdings amounted to 431 million dollars.

The public utility holdings of the United States life insurance companies have increased materially in recent years, as the terrific postwar demand for all utility services and the general expansion of the economy developed. Total public utility bond holdings of the life companies at the start of last year were $8,756,000,000 greater than 10 years earlier and nearly seven times the 1935 figure.

In the early 1920's, only 2 per cent of the life company assets were invested in public utility bonds. By 1935, 9 per cent of their assets were so invested and at the start of last year nearly 16 per cent. Public utility bonds have become one of the important investment portfolios with the life insurance companies, now accounting for more than *one-third* of the securities of business and industry held by them.

The spread of long-term financing out across the country is clearly shown in the public utility portfolio. A recent analysis of the holdings of a representative group of life insurance companies showed that the investment in public utility bonds of southern and western utilities have grown more rapidly than eastern utilities, in the company portfolios. In the past 10 years, the bonds of utilities in the Southwest have more than quadrupled in the life insurance portfolios; in the Mountain States they have nearly quadrupled; in the East South Central states and Pacific Coast states, they have more than tripled; and in the other regions, excepting only Middle Atlantic, they have more than doubled.

## SAFETY THUMB TACKS

### By John A. Bracken

**Bits of safety reasoning, either pointed or flat, depending upon the way you look at them:**

**"The cost of SAFETY is only a thought."**

*

**"It is good practice to form the habit of thinking SAFETY before acting."**

*

**"In practicing SAFETY, three things are necessary—knowledge, judgment and care."**

*

**"The more SAFETY is practiced as a habit—the safer one becomes from the habit."**

*

**"Opportunities to practice SAFETY are always present."**

### *Unclaimed Deposits*

Now and then public utilities of all kinds have questions arise as to unclaimed deposits or other moneys being held for the benefit of subscribers or customers who have died without heirs, moved away, disappeared, etc. Sometimes these funds result from deposits required for the extension of service to customers whose credit has not been established. In other cases, they may result from refunds ordered by regulatory commissions growing out of rate cases. And, there are still other cases in which customer credits can be created with a public utility company.

Since telephone companies operate mainly on a prepayment basis (meaning that they are billed in advance of the service period, instead of after it has been rendered, which is the usual practice of gas and electric companies), the unclaimed customer deposit to insure credit is not as frequent an occurrence with the telephone utilities as with other kinds of utilities. Nevertheless, whenever any such unclaimed customer credits occur or accumulate over a number of years, there are always bound to be a few which have to be designated "unclaimed" because the utility company is unable to find the party entitled to the money.

What happens in such cases? The practice varies. But a recent decision of the New Jersey Supreme Court has an interesting solution favorable to the utility companies—at least in that state.

It seems that New Jersey, like a number of other states, has what is known as an "escheat" law. Under this law, people who die leaving estates without heirs to claim them or wills to dispose of them, actually leave it to the state government. The same is true with relation to other available funds which might remain unclaimed as a result of payments due under contracts, winning lottery tickets, and a variety of situations. Where there is an escheat law, the state, acting under its general welfare powers, takes a position which might be roughly summarized as "If nobody else claims it, the state claims it." This is supposed to be for the benefit of the common welfare. Such laws have been upheld as valid.

The question before the New Jersey Supreme Court was whether an unclaimed utility customer deposit would come within an escheat law. Or, could the public utility company just keep it, after a long enough period of waiting and searching? The money involved was not exactly peanuts. As a matter of fact, a tidy little sum of $18,416 had accumulated with the Atlantic City Electric Co. over a period of 14 years. This fund was made up entirely of deposits left unclaimed by the utility company's customers. The court voted 5 to 2 that the Atlantic City Electric Co. could keep the money.

Lawyers for the state of New Jersey had argued that the common treasury of the state was entitled to the money under the escheat law because the money held by the utility company was similar to a trust fund. But the majority of the court ruled that there was a continuing relationship between the utility and its customer, subject to service tariffs under which the original contract with the customer was entered. The majority felt that the state had no claim to the money under these conditions.

# 3-Dimensional Engineers

By FREDERICK R. KAPPEL*

THE other day I was told of a certain college president who was invited to talk to a woman's club. He said all right, what would they like him to talk about? The ladies replied, "We'd like you to tell us your seven greatest thoughts."

I never did find out what his thoughts were, but mine today, as you might suspect, are all about engineers and engineering. This seems to be a popular subject these days. In fact, I notice in the program for this week that at least seven other talks or papers will discuss it one way or another.

But I'll keep the number of my thoughts short of seven. That's too many for after lunch. I'll stick to three and lay them all out on the table right now.

In the first place, I have the greatest possible admiration for what our engineers have done to help make life better for more and more people.

Secondly, these changing times ask more *of* engineers and need more *from* engineers. Of this I have no doubt at all.

Thirdly, what are we going to do about it? How are we changing to meet the need? I'd like to expose my notions on that.

### *Helped Raise Living Standards*

On the first point, just in this last generation—in the last 25 or 30 years—engineers have helped this country to improve its standard of living in a way that has never happened before anywhere. This notwithstanding World War II, Korea, and all the burden of defense we bear today.

Probably there's no single measure to express this. However, you can sum up a lot this way: Since the early 1920's, production per man-hour of work in private industry has just about doubled. Along with this, and because of it, while population and employment have both risen only about one-third since 1929, our gross national product has more than doubled. But the big payoff is that the average disposable income of Americans—in constant dollars and after taxes—has gone up well over 50 per cent.

And in recent years something has come about in the United States that tells the same story in a different way. For the first time in history, the men and women of this country are devoting more hours to providing services than they now spend to produce goods.

We spend more time flying airplanes, hauling freight cars, distributing power, handling telephone calls, keeping store, lending money, taking care of the sick, making and showing movies, washing windshields, producing TV programs, teaching school, and performing thousands of other services, than we spend to grow food, make steel, produce oil, weave cloth, dig in mines, build houses, make automobiles, and turn out all the other products of manufacturing industry.

### *Measure of Engineering*

This in itself is a remarkable measure of what science and engineering have helped to bring about. Needless to say, the vast growth in service employment tells a story of millions of new jobs created. That's almost by definition. But, my point is simply that we have come so far in enabling people to live beyond the limits of necessity. And I repeat—for the contribution you and other engineers have made to this, I have the greatest admiration.

However, that's enough about the past. The responsibilities now converging on the engineer are greater than ever before. As I've said, the times we live in ask more of us and need more from us.

You don't need to hear again from me about the race with Russia. That concerns me as much as it does you, but there are plenty of other things to be working at right on our own front porch.

For instance, take the way our population is increasing. We're growing at the rate of nearly three million people a year. Most important, however, we shall have a continually rising proportion of older people who have finished their working years, and also, for the next decade, a larger proportion of young people below working age. This means that a relatively smaller working group will have to support a much bigger nation.

### *Job is Gigantic*

If we expect to do this in the style to which Americans have become accustomed—and also I hope push the standard of living higher—we have a real job on our hands. And if on top of this, or along with it, we are to give economic aid and comfort to other parts of the world to keep them with us and not against us—well, let's face it: the job is gigantic.

The fact is that technological progress is not something that we can just look forward to with pleasant anticipation. It's a necessity. We *have* to have it because we shall have to produce more, and as I said, there will be relatively fewer people of working age. We can't just dream about shorter and shorter and shorter hours. We need to work and work hard, and we also need more and better tools, more mechanization, more plant and equipment that will do more work for us. And it's already coming home to us what this means in increased capital investment.

In the Bell System alone we expect to invest 2½ billion dollars this year in new telephones, cables, radio relay systems, central offices, and other equipment. For all industry, estimates

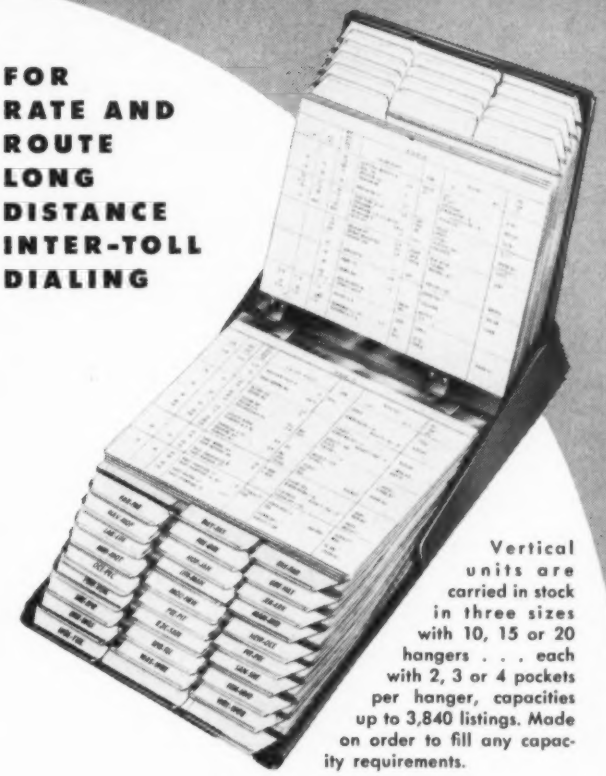
*Mr. Kappel is president of American Telephone & Telegraph Co. He gave this address at the Winter General Meeting of American Institute of Electrical Engineers—Jan. 21 in New York City.

ACME VISIBLE

**FOR RATE AND ROUTE LONG DISTANCE INTER-TOLL DIALING**

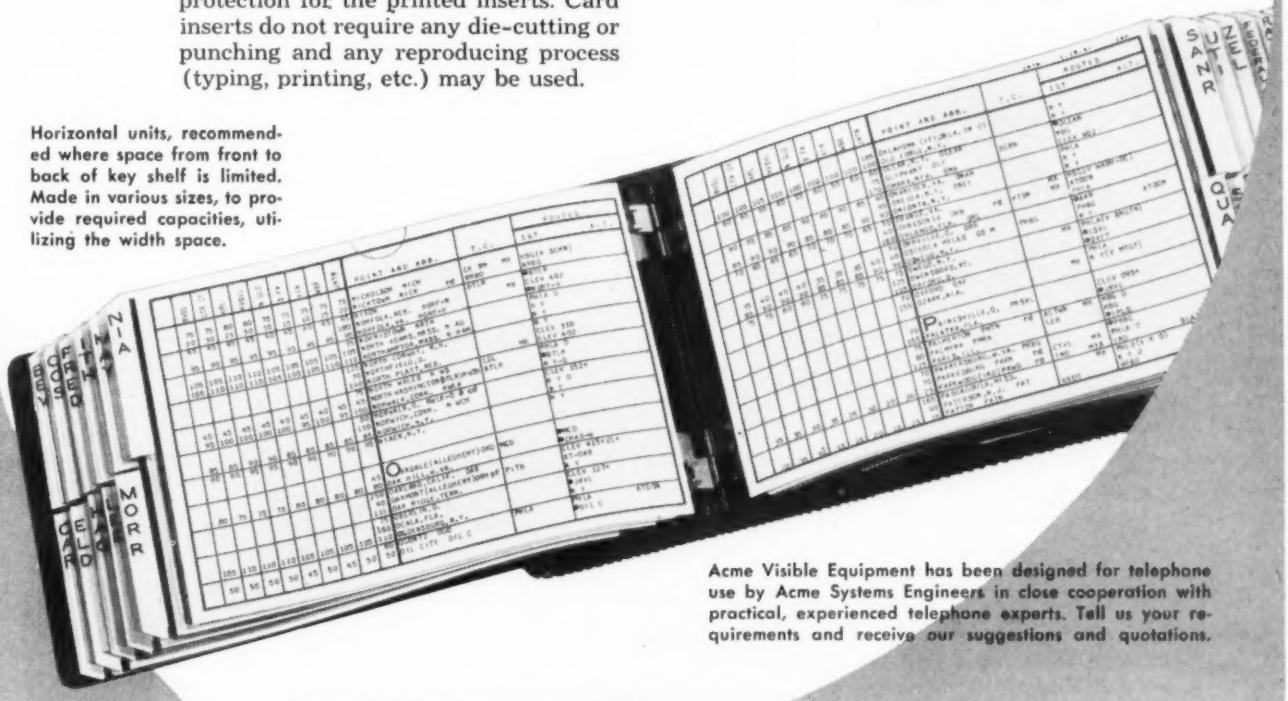
# MULTI-CARD BULLETIN HOLDERS

Developed by Acme, working in connection with telephone engineers, to meet the exacting needs of the telephone industry, to conserve time, reduce cost of operation and improve customer service. They employ the use of clear transparent cellulose acetate pockets which hold card inserts. Suspended on steel hangers with 2, 3 or 4 pockets per hanger, both sides are visible. Made especially for Acme Bulletin Holders, with permanently attached hinges and reinforced index tabs, they provide real protection for the printed inserts. Card inserts do not require any die-cutting or punching and any reproducing process (typing, printing, etc.) may be used.



Vertical units are carried in stock in three sizes with 10, 15 or 20 hangers . . . each with 2, 3 or 4 pockets per hanger, capacities up to 3,840 listings. Made on order to fill any capacity requirements.

Horizontal units, recommended where space from front to back of key shelf is limited. Made in various sizes, to provide required capacities, utilizing the width space.



Acme Visible Equipment has been designed for telephone use by Acme Systems Engineers in close cooperation with practical, experienced telephone experts. Tell us your requirements and receive our suggestions and quotations.

MAIL COUPON TODAY

ACME VISIBLE RECORDS, INC. Telephone System Division, Crozet, Virginia

Please send us illustrated booklet T2-9-57

☐ #1088 on Acme Switchboard Keyshelf Units ☐ #975 on Acme Flexoline

☐ Have representative call. Date_____ Time_____

☐ We are interested in Acme Visible equipment for_____ (KIND OF RECORD) records.

COMPANY_____ ATTENTION_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

DEPARTMENT OF TECHNOLOGY BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

vary, but I saw one forecast the other day that industry would lay out 40 billion dollars for new plant and equipment in 1957, and that the annual outlay would pass 55 billion dollars by 1965.

### *Investment Must Produce*

And who will see to it that all this money is wisely spent? To a very considerable extent, it must be the engineer. He is the architect of industry who must make sure that this huge investment will really produce — meaning, of course, produce at a profit.

And as he works at the job, the technical resources he is working with, and also the needs of the people, are constantly changing.

On the technical side, take the changes in telephone transmission as just one example. It began on open wire lines, then went on to transmission over pairs of wire in cables. Cable carrier systems began about 1938, and soon afterward came coaxial cables.

Next came microwave radio systems, and later, over-the-horizon radio. To build them the engineer now has available klystrons, traveling-wave tubes, magnetrons, silicon diodes, coaxial lines and wave guides, resonators and filters and antennas.

Meanwhile, other carrier systems continue to multiply. One of the latest, designed for rural telephone lines, uses transistors and has been tested successfully with a solar battery supplying power.

This year we expect to try out a new pulse transmission carrier system with repeaters using transistors and other miniature apparatus.

### *Systems Multiply*

In my own engineering experience, I've seen the maximum facility for telephone transmission change from three channels over a four-wire phantom group to a 14,000-circuit microwave system that is now under development, with the possibility of a 400,000-channel wave guide system coming along in the future.

And, as systems multiply, and we learn new arts and new applications, components keep multiplying also. By the end of this year for example, we expect to have more vacuum tubes working at the bottom of the sea than we had in the whole Bell System in 1920. In 1930 about 85 different kinds of vacuum tubes were available. Now there are more than 1,400. The transistor was invented by Doctors Brattain, Shockley and Bardeen of Bell Laboratories in 1948. Today more than 180 varieties are commercially available.

I've given just a few illustrations

F. R. KAPPEL

of rapid change in one field that I happen to be familiar with. We all know the same thing is going on in every field of engineering. Science is opening up new ways to live, new ways to work, new ways to travel on wheels or fly in the air. We're learning new ways to communicate, compute, control, and produce. We have new sources of power still in their infancy, and a great need to cause them to grow. We organize new systems out of new devices, and new devices out of new materials, and we deal with the sub-atomic particles of elements which formerly did not even exist, at least to our knowledge.

### *Lead Expanding Life*

Anyone who has any doubt about the pace of engineering progress could remove it pretty quickly, I think, just by glancing through the technical program for this meeting. To mention only one example, who would have foretold a few years ago that this program in 1957 would include papers on earth satellite communications and earth satellite telemetering?

This brings me to the main point I want to make, which is that in this dynamic and expanding world the competent engineer has to lead a dynamic and expanding life. In my judgment there is simply no room left for any routine approaches to engineering, or for standing still with the mental equipment we've got. The engineer has to grow and change with the times, and constantly equip himself to handle new problems. He has to nourish his mind and broaden his outlook to make sure that neither gets obsolete. And at all times, he has to look ahead.

Obviously, we need the most in creative imagination, ability to take on new assignments, and selective judgment. I think the growing tendency in the schools to concentrate on fundamentals is very helpful to this, because the first need is to develop the basic mental equipment. There remains to industry the great responsibility to provide not only first-rate technical training but also to make sure the able engineer never gets locked in his technical closet.

### *Must Know Other Business Facets*

To be sure, he always remains an engineer, with a sound grasp of engineering fundamentals that never grow obsolete. But he also becomes something more. As he applies ever-changing arts he is also thoughtful of their effects. He gains and uses knowledge of marketing and finance. He interprets between designer and salesman. He perceives and understands the general wants and particular problems of other people, whether he holds a supervisory position or not.

For such engineers I am quite sure the rewards will be ample—and I mean in money as well as in the sense of accomplishment. And, as I indicated, for people of ability, who have a real proprietary interest in the business they're engaged in, and want to make their interest effective in action, industry must certainly provide full opportunity for education and growth.

To illustrate what I mean, let me give you just a thumbnail outline of some of the educational activities we're organizing in Western Electric, Bell Telephone Laboratories, and the operating telephone companies.

### *100 Men Enter Yearly*

The Communications Development Training Program at the Laboratories, or CDT for short, is well known. It began in 1948 in response to the need to prepare graduate engineers for research and development work. The program extends over three years with about half the time in classroom work. More than a hundred men enter CDT each year.

Starting in 1956 a small number of CDT students are being awarded fellowships to allow them to study for their doctorates. While doing this they continue as employes at full salary.

About 140 professional members of the laboratories are doing graduate work at nearby universities during part of their working hours, with tuition refunded by the laboratories. For technical aides and also for engineers, the laboratories also conduct numerous out-of-hours courses. Participation is voluntary and we expect some 1,500 registrations this year. In addition a monthly lecture program has an average attendance of about 700.

The operating companies of the Bell

# *Keep Important Information at their Finger Tips...ALWAYS*

**LINEDEX®**

Speed up reference time and improve service by placing a wealth of data right at your operator's finger tips with **Linedex** Rotary Visible equipment. These compact, flexible "read-at-a-glance" units are ideal for applications where a large volume of listings are handled as in the case of information boards, intercepting boards, and test boards. They also provide speedy reference for the efficient handling of trouble calls.

All pertinent information is listed on convenient visible inserts which can be removed, replaced or rearranged with a minimum of effort. Color signals can be used with **Linedex** to show line out of order, grounded, suspended for nonpayment or other information.

**SPEEDAC CHAINDEX®**

Operation of your PBX installation can be immeasurably improved by making available to your subscribers Remington Rand **Speedac Chaindex** Reference Units. These exclusive KEY SHELF DIRECTORY UNITS for telephone numbers and extensions are specifically designed to speed subscribers' service and ease the operator's duties.

With **Speedac Chaindex**, fast reference to any of 1040 lines of information is made with a flip of the pocket. Removal or replacement of information can be made instantly without disturbing the order of the other lines. **Chaindex** cards feed into typewriters or addressing machines easily. **Speedac Chaindex** is compact – 5½ x 10¼ inches.

**SPEEDAC® Multi-Card**

Long distance calls are handled with greater speed and accuracy...lost time due to trunking to another information source is eliminated... and rate and route information is instantly available to operators handling long line switchboards, thanks to **Speedac** Multi-Card. This compact Bulletin Holder Unit makes these things possible by completely listing day and night rates for both person to person and station to station calls...route information...toll centers and other frequently called points. A flip of a pocket is all that is necessary for speedy reference and with Multi-Card changes can be made quickly when information revisions are necessary.

For further information on these fine products send for free holders KD767 and KD734.
Write to Room 1259, Remington Rand, 315 Fourth Avenue, New York 10, New York.

**Remington Rand**
DIVISION OF SPERRY RAND CORPORATION

vary, but I saw one forecast the other day that industry would lay out 40 billion dollars for new plant and equipment in 1957, and that the annual outlay would pass 55 billion dollars by 1965.

### *Investment Must Produce*

And who will see to it that all this money is wisely spent? To a very considerable extent, it must be the engineer. He is the architect of industry who must make sure that this huge investment will really produce — meaning, of course, produce at a profit.

And as he works at the job, the technical resources he is working with, and also the needs of the people, are constantly changing.

On the technical side, take the changes in telephone transmission as just one example. It began on open wire lines, then went on to transmission over pairs of wire in cables. Cable carrier systems began about 1938, and soon afterward came coaxial cables.

Next came microwave radio systems, and later, over-the-horizon radio. To build them the engineer now has available klystrons, traveling-wave tubes, magnetrons, silicon diodes, coaxial lines and wave guides, resonators and filters and antennas.

Meanwhile, other carrier systems continue to multiply. One of the latest, designed for rural telephone lines, uses transistors and has been tested successfully with a solar battery supplying power.

This year we expect to try out a new pulse transmission carrier system with repeaters using transistors and other miniature apparatus.

### *Systems Multiply*

In my own engineering experience, I've seen the maximum facility for telephone transmission change from three channels over a four-wire phantom group to a 14,000-circuit microwave system that is now under development, with the possibility of a 400,000-channel wave guide system coming along in the future.

And, as systems multiply, and we learn new arts and new applications, components keep multiplying also. By the end of this year for example, we expect to have more vacuum tubes working at the bottom of the sea than we had in the whole Bell System in 1920. In 1930 about 85 different kinds of vacuum tubes were available. Now there are more than 1,400. The transistor was invented by Doctors Brattain, Shockley and Bardeen of Bell Laboratories in 1948. Today more than 180 varieties are commercially available.

I've given just a few illustrations

F. R. KAPPEL

of rapid change in one field that I happen to be familiar with. We all know the same thing is going on in every field of engineering. Science is opening up new ways to live, new ways to work, new ways to travel on wheels or fly in the air. We're learning new ways to communicate, compute, control, and produce. We have new sources of power still in their infancy, and a great need to cause them to grow. We organize new systems out of new devices, and new devices out of new materials, and we deal with the sub-atomic particles of elements which formerly did not even exist, at least to our knowledge.

### *Lead Expanding Life*

Anyone who has any doubt about the pace of engineering progress could remove it pretty quickly, I think, just by glancing through the technical program for this meeting. To mention only one example, who would have foretold a few years ago that this program in 1957 would include papers on earth satellite communications and earth satellite telemetering?

This brings me to the main point I want to make, which is that in this dynamic and expanding world the competent engineer has to lead a dynamic and expanding life. In my judgment there is simply no room left for any routine approaches to engineering, or for standing still with the mental equipment we've got. The engineer has to grow and change with the times, and constantly equip himself to handle new problems. He has to nourish his mind and broaden his outlook to make sure that neither gets obsolete. And at all times, he has to look ahead.

Obviously, we need the most in creative imagination, ability to take on new assignments, and selective judgment. I think the growing tendency in the schools to concentrate on fundamentals is very helpful to this, because the first need is to develop the basic mental equipment. There remains to industry the great responsibility to provide not only first-rate technical training but also to make sure the able engineer never gets locked in his technical closet.

### *Must Know Other Business Facets*

To be sure, he always remains an engineer, with a sound grasp of engineering fundamentals that never grow obsolete. But he also becomes something more. As he applies ever-changing arts he is also thoughtful of their effects. He gains and uses knowledge of marketing and finance. He interprets between designer and salesman. He perceives and understands the general wants and particular problems of other people, whether he holds a supervisory position or not.

For such engineers I am quite sure the rewards will be ample—and I mean in money as well as in the sense of accomplishment. And, as I indicated, for people of ability, who have a real proprietary interest in the business they're engaged in, and want to make their interest effective in action, industry must certainly provide full opportunity for education and growth.

To illustrate what I mean, let me give you just a thumbnail outline of some of the educational activities we're organizing in Western Electric, Bell Telephone Laboratories, and the operating telephone companies.

### *100 Men Enter Yearly*

The Communications Development Training Program at the Laboratories, or CDT for short, is well known. It began in 1948 in response to the need to prepare graduate engineers for research and development work. The program extends over three years with about half the time in classroom work. More than a hundred men enter CDT each year.

Starting in 1956 a small number of CDT students are being awarded fellowships to allow them to study for their doctorates. While doing this they continue as employes at full salary.

About 140 professional members of the laboratories are doing graduate work at nearby universities during part of their working hours, with tuition refunded by the laboratories. For technical aides and also for engineers, the laboratories also conduct numerous out-of-hours courses. Participation is voluntary and we expect some 1,500 registrations this year. In addition a monthly lecture program has an average attendance of about 700.

The operating companies of the Bell

# *Keep Important Information at their Finger Tips...ALWAYS*

**LINEDEX®**

Speed up reference time and improve service by placing a wealth of data right at your operator's finger tips with **Linedex** Rotary Visible equipment. These compact, flexible "read-at-a-glance" units are ideal for applications where a large volume of listings are handled as in the case of information boards, intercepting boards, and test boards. They also provide speedy reference for the efficient handling of trouble calls.

All pertinent information is listed on convenient visible inserts which can be removed, replaced or rearranged with a minimum of effort. Color signals can be used with **Linedex** to show line out of order, grounded, suspended for nonpayment or other information.

**SPEEDAC CHAINDEX®**

Operation of your PBX installation can be immeasurably improved by making available to your subscribers Remington Rand **Speedac Chaindex** Reference Units. These exclusive KEY SHELF DIRECTORY UNITS for telephone numbers and extensions are specifically designed to speed subscribers' service and ease the operator's duties.

With **Speedac Chaindex,** fast reference to any of 1040 lines of information is made with a flip of the pocket. Removal or replacement of information can be made instantly without disturbing the order of the other lines. **Chaindex** cards feed into typewriters or addressing machines easily. **Speedac Chaindex** is compact – 5½ x 10¼ inches.

**SPEEDAC® Multi-Card**

Long distance calls are handled with greater speed and accuracy...lost time due to trunking to another information source is eliminated... and rate and route information is instantly available to operators handling long line switchboards, thanks to **Speedac** Multi-Card. This compact Bulletin Holder Unit makes these things possible by completely listing day and night rates for both person to person and station to station calls...route information...toll centers and other frequently called points. A flip of a pocket is all that is necessary for speedy reference and with Multi-Card changes can be made quickly when information revisions are necessary.

For further information on these fine products send for free holders KD767 and KD734.
Write to Room 1259, Remington Rand, 315 Fourth Avenue, New York 10, New York.

**Remington Rand**
DIVISION OF SPERRY RAND CORPORATION

System are also moving to broaden their training.

### *Special Courses Available*

Several of the companies have organized specific courses for engineers of from one to 12 weeks. One course for instance relates engineering to the over-all activity of the company. Another is on transmission. Others cover tariffs and rates, technical writing, the work of other engineering groups in the company, reasons behind the operations of other branches of the business, and so on.

Last September about 50 graduate engineers of the operating companies began 22 months of classwork and study at Bell Laboratories to get a basic understanding of new telephone art, including electronic switching. We are just at the beginning of a gradual transformation of the Bell System's physical plant. In each company we shall have to have engineers who will take leadership in effecting this physical transformation, and also in training other engineers. This is the first step in a continuing program to that end.

In general I would say we were in the early stages of extending engineering education in the operating telephone companies. Much more is being organized right now, and the program that is taking shape in Western Electric may also be considered typical of efforts in the operating companies as well.

### *Three WE Study Centers*

By late summer Western Electric will have three study centers, in New York, Chicago, and Winston-Salem. Here, both new and experienced engineering employes will be enrolled. New engineers, after their first four to six months with the company, will take a series of introductory courses to help them move into a full assignment. After a year's service they will have 10 weeks more of study and discussion, not only on technical subjects but also in dealing with people. For experienced engineers there will be a wide variety of advanced courses.

In addition, Western Electric now operates a plan to encourage employes to study on their own time at accredited colleges. The company will refund up to $250 a year tuition to any employe, part on enrollment and the rest on successful completion of courses which the company feels are related to the employe's present job, or to a job he might reasonably aspire to hold.

Throughout the Bell System engineers are also participating fully in management development programs. We want engineers and other management people to think out problems together.

When we started our executive conference at Asbury Park two and a half years ago we had several ideas in mind. We wanted to bring telephone management people and top-flight men in other fields together for discussion and case study, and let the sparks fly. We wanted the least teaching in the sense of prescribing, and the most learning through one's own thinking. We hoped too that the Asbury Park idea would spread all through the Bell System at different levels of management.

All these things are taking place. And we shall encourage them more, not less. Indeed, we must.

### *80,000 Into Management*

Over the next 10 years we foresee that more than 80,000 Bell System people — engineers included — will be moving into new positions in management. In the same 10 years we shall be going a long, long way in the transformation of our physical telephone system. New art and new applications will bring new convenience in service and new forms of service. In fact, we expect the time is coming when we'll be able to communicate anything you want in just about any way you want, and over any distance, long or short. With people changing, management changing, technology changing, and service changing, it is unthinkable not to use every means in our power to improve our competence and at the same time our understanding of the world around us and our place in it.

You'll forgive me I hope for talking so much about the Bell System. But I think our need for engineers of ability and imagination is typical. We all need them like grass needs rain. And I think we can make rain.

We won't do it by just tagging or labeling people as engineers. We won't do it by putting engineers into compartments and shutting them off from the rest of the ship. We won't do it by cramming size 42 men into size 36 jobs, or vice versa. We won't do it by setting so-called minimum standards and then sitting back and letting nature take its course.

### *Developing Three Dimensions*

We *will* do it, I believe, through intelligent and concerted effort to develop what I call three-dimensional engineers.

The first dimension we'll say is what you got in college, that showed you how to move in a straight line in your first particular field.

The second dimension is in continued training and self-study, that broadens a man—or a woman—and keeps him up-to-date with technological changes so he can solve problems in broad areas and new areas of engineering.

The third dimension is the height that comes from the mixing and mingling of engineering and management ideas, so that the engineer's understanding of the problems and requirements *of* the business makes him more effective *in* the business. This understanding comes not only from study but from shoulder-to-shoulder association and contact and interaction between engineering, operating, financial and merchandising people. And we need this third dimension not here and there among engineers but everywhere —so they will have a volume effect on the business. If engineering is to be solid, it's got to have this volume.

As I've tried to indicate, I think industry can contribute much, especially to the second and third dimensions. Right now in our business, because of the effort we're making in these directions, we're getting a wonderful amount of fine engineering work done that otherwise could never have been done so soon or so well. More than that, with a wider appreciation by other people in management of the engineer's contribution, I'm confident we're getting a better team and a better over-all job. And, I am equally confident that our engineers are profiting in prestige, promotion, and salary rewards as a result.

As the need for technology increases further—and it surely will—it seems to me it is inevitable that the need for engineers in management including top management will likewise continue to increase. I don't see how it can be otherwise. What this means is simply that engineers must grow, and, of course, it is they themselves who must do the growing. No one else can do it for them. The training and education I've been talking about are essential, all right, but what they add up to in the end is only the soil to grow in.

Knowing engineers as I do, and I've lived and worked with them all my life, I can only say there is no group I would sooner trust to respond to whatever challenge. As I see it, the challenge to engineers today is that they should deliberately work to fill out all the height, all the depth, and all the breadth they can reach. Along with this, industry is equally challenged to give able engineers full opportunity to live and work and think and create in all three dimensions. For this is the kind of engineering influence and leadership we need, and I have great faith we shall get it, to the further advantage of our country and the world.

# NETWORK . . .

**DEFINITION BY DR. SAMUEL JOHNSON (18th CENTURY)—Anything reticulated or decussated, with interstices between the intersections.**

**DEFINITION BY STROMBERG-CARLSON (1957)—The 6K-1 System . . . A fingertip PBX for your commercial subscribers.**

Definitions change with the times. Our definition of a complete intercommunications network is *6K-1*. This system, like others on the market, offers your subscribers the numerous advantages of multi-line service plus the new Stromberg-Carlson intercom dialing feature.

Other features include: tie lines to connect one 6K-1 System to another; identifying lamp signals; office gray color instruments.

For sales aids and full information on the income-boosting aspects of the 6K-1, contact your Stromberg-Carlson representative.

S-C STROMBERG-CARLSON

**STROMBERG-CARLSON COMPANY**

A DIVISION OF GENERAL DYNAMICS CORPORATION

GD GENERAL DYNAMICS

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

# THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THROUGH the courtesy of Clyde S. Bailey, the writer and R. C. Reno had a grand view of President Eisenhower's inaugural parade. There is no doubt that one of the best places to view this grand spectacle is from the windows of the USITA's office on Pennsylvania Avenue.

Although business is practically at a standstill in the Nation's Capital on this one day each fourth year, we were impressed with the fact that business in the offices of the USITA was being carried on. Out-of-town telephone calls from areas where this day was not being observed came in with about normal regularity. The office staff was on hand and information requested was furnished in all cases, without delay.

•

In a recent letter, Warren E. Butters, manager of the Northern Nevada Telephone & Telegraph Co., Tuscarora, Nev., states that they have a No. 9 galvanized iron, grounded line 150 miles long with 80 subscribers connected which provides acceptable service with fair transmission. He states further that they do not know how it does it and suggests that we figure it out in our spare time.

We give up before we start as we are afraid that we do not have that much spare time.

•

The Pacific Telephone & Telegraph Co. operates more than 100,000 coin telephones. The return from these telephones represents about 6 per cent of that company's revenue. This phase of their business requires that about six to eight tons of coins be collected and counted each day. Tons of money may be better understood when we consider the following:

$ 200 in nickels weighs 44 pounds.
$1000 in dimes weighs 54.6 pounds.
$1000 in quarters weighs 54.9 pounds.

Some coin boxes operated by this company must be collected as often as every two days while others go as long as 168 days. The objective of the collector is to visit the box before it fills up with coins and jams the telephone. Collecting from it too often though would be a waste of time.

This company states that most people are honest. Slug losses average from 4 to 18 cents per month per coin telephone, according to the location. Occasionally they find a penny which some poor soul with a misdirected ambition has spent hours filing down to dime size.

•

A new low-cost ultrasonic soldering iron, capable of soldering aluminum without flux by completely removing the oxide film on the surface, has recently been placed on the market in this country.

This tool applies ultrasonic power, silent sound waves, through the molten solder to the surface of the aluminum or other light metal. A "cold boiling" effect, called cavitation, is produced within the solder. The cavitation bubbles, completely removing all oxide from the metal surface and allowing action by the solder and, thus, tinning take place. No flux is required.

•

One of the Blain's dogs recently developed a serious tumor and our veterinarian decided that it must be removed immediately if his life was to be saved. The operation, which was performed the evening of Jan. 1, proved successful and we were allowed to bring him home on Saturday morning (Jan. 5). We were cautioned, however, that he should be kept quiet for about five days and then we should return him to the animal hospital to have the stitches removed.

When we arrived home, we let the dog out of the car and he strolled over to his favorite tree to check on any letters which the neighborhood canines might have left there for him during his absence. Suddenly, a timber squirrel arrived on the scene.

The race was on immediately and after circling the house the third time the squirrel won by climbing a convenient tree. Fortunately, the stitches held and our dog appears to be back to normal.

We have fond hopes that he will be with us for many more years, thanks to the skill of that veterinary surgeon.

•

The Indianapolis works of the Western Electric Co., turns out 125,000 telephone sets every week. Placed side by side, they would make a row of telephones 10 miles long.

•

A new type of warning device has recently been placed on the market which can be used on the rear end of pole trailers and other dangerous loads when hauled along heavily traveled highways. This new rear-end warning device combines a red light, red reflector, and a red flag. The flashing light is operated from a dry cell battery.

•

We had the pleasure recently of testing a new type wire stripper which appears to be a near-perfect tool. Constructed of thin flat metal its over-all length is about 5 inches. It operates like a pair of pliers and the blades at the end have been hardened and ground so that wire can be cut cleanly and neatly.

Notches in a "V" shape are provided near the end of the tool. When the handles are pressed together normally, a hole is formed in the "V" notch of a proper size to cut the insulation on a 24-gauge wire.

An adjustment stop on the gripping handles may be set so that the strip-

# "We'll be gone all day. We're hiking clear to the next pole!"

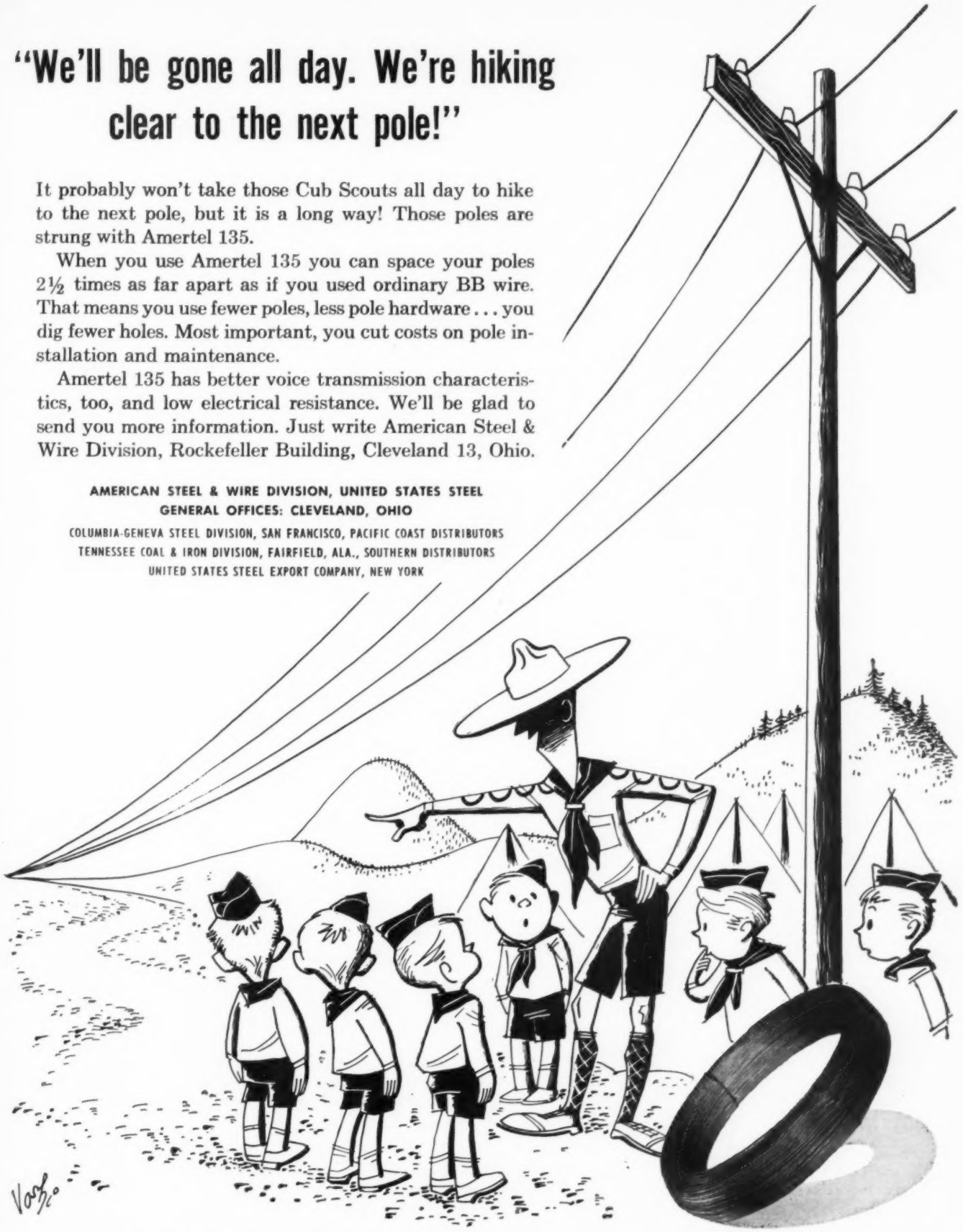
It probably won't take those Cub Scouts all day to hike to the next pole, but it is a long way! Those poles are strung with Amertel 135.

When you use Amertel 135 you can space your poles 2½ times as far apart as if you used ordinary BB wire. That means you use fewer poles, less pole hardware . . . you dig fewer holes. Most important, you cut costs on pole installation and maintenance.

Amertel 135 has better voice transmission characteristics, too, and low electrical resistance. We'll be glad to send you more information. Just write American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL
GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



# USS TIGER BRAND AMERTEL

TELEPHONE & TELEGRAPH WIRE

UNITED STATES STEEL

ping blades will be properly spaced to remove the insulation from various sized wires. A small plier nose is fashioned on the end of the stripping blades.

This single tool can be used to cut the wire to the proper length, strip the insulation and then wrap it around the terminal and make it ready for soldering. Not only does this tool save time and labor costs, but it also makes possible a better grade of workmanship. In our opinion, every main frame should be equipped with one or more of these tools.

•

The accompanying photograph was sent us by Col. A. O. McLane, Signal Corps, Retired, who is presently on an engineering assignment for the Gustav Hirsch Organization in Alaska.

The picture shows a crew working on a job of plowing in a 202-pair cable across a shallow lake. The plow and trailer are being winched across the lake. The ice is about 6 inches thick.

We are advised that this is a good trick if you have an abundance of winch power.

•

A new type emergency light that should prove desirable in the telephone exchange is merely plugged into the nearest 110-volt ac outlet. If there should be any interruption in the regular lighting circuit, the emergency light comes on instantly and automatically from power supplied by a standard 6 or 7½-volt dry cell battery.

•

It is an amazing fact that 65 communities in the United States can now dial long distance to 16 million telephones in 17 metropolitan areas.

# Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

**Q. We recently read an article in a national magazine which stated that methyl chloroform could be substituted for carbon tetrachloride without the harmful effects which carbon tetrachloride has on the human body. Will you kindly inform us as to the cleaning properties of methyl chloroform compared with that of carbon tetrachloride for cleaning relay contacts and generator armatures? We'd like to know also if there is any danger in its use.**

A. We have never heard of methyl chloroform being used as a substitute for carbon tetrachloride for cleaning relay contacts. However, we have checked with one authority on this subject who claims that methyl chloroform will prove effective for cleaning contacts. He further states that the fumes from it may make the user sleepy, but that they are non-toxic. It is suggested that you make some tests on a few contacts and observe for yourself the results.

Under no consideration should carbon tetrachloride be used in a confined place as the fumes are deadly. Most telephone companies have discontinued the use of carbon tetrachloride entirely because of the dangers involved.

Ether is also a good contact cleaner, but because of its highly explosive effect, its use cannot be recommended.

•

**Q. We understand that there is a system now available whereby a special signal may be carried over existing telephone circuits without interfering in any way with the regular telephone service. Will you please describe this system?**

A. From the information we have been able to obtain, this new signal transmitting system appears to be extremely simple in both equipment and operation. The equipment consists of a transmitter, located on the premises of a subscriber, a receiver which is an amplifier and relay located in the telephone central office, and a device to provide a signal at a receiving point. This signal may be audible, visual or both.

The transmitter is powered by two No. 6 dry cells so that operation is not affected by power failure. The central office equipment is energized by the standard central office power supply.

The transmitter is a transistorized oscillator coupled to the line by means of a balanced circuit to impose a frequency between 6,000 and 8,000 cycles on the telephone line.

This frequency is received at the central office and amplified by a two-stage transistorized amplifier. This amplifier is coupled to the line in the same manner as the transmitter so that the presence of a signal on the line will cause a standard telephone relay to operate.

A longitudinal suppression filter is provided in the line beyond the receiver to prevent transmission through the central office and to cause the operation of other alarms.

The transmission of the signal from the relay can then be arranged to suit the particular requirements of the subscriber. The simplest form of signal reception would be a light indicator in the central office. The signal can be transmitted over a leased circuit to a police station, telephone answering service, or any other remote point.

Some suggested uses of this system are the remote supervision of burglar and fire alarms, protection of public telephone coin boxes, inter-office supervision of telephone alarm systems between attended and unattended offices, and telemetering systems for remote transmission of pulse type signals.

•

**Q. What is the longest span length permissible for the use of self-supporting plastic-insulated and jacketed cable?**

A. When No. 19 Copperweld conductors are used, a maximum span length of 250 feet is recommended. The span may be extended to 325 feet for 11 pairs, and 400 feet for 16 and 26 pairs.

# SUPERIOR TOLL CABLE

## is quality-engineered for better performance!

**TWISTING AND QUADDING**
Newest in twisters and quadding equipment produce uniformly twisted pairs and quads. Staggering the lay of pairs and quads and twisting uniformly minimizes crosstalk.

**CABLING**
Engineering techniques plus cabling equipment designed for the job offers compact, trouble-free, efficient cable cores. Tension is automatically controlled during cabling.

**TAPE**
Double thickness of irradiated polyethylene tape results in unexcelled dielectric strength from core to shield. The deviation in mutual capacitance is less than 1½ percent.

**SHIELD**
An aluminum shield of 5 mil thickness, spirally applied with 25 percent overlap, protects the cable from lightning and noisy circuits.

**JACKET**
The highest quality, high molecular weight grade of polyethylene for the jacket provides maximum resistance to stress cracking, corrosion, and mechanical damage.

**CONDUCTORS**
Conductors meet the requirements of ASTM B-3 for copper purity and electrical conductivity. After insulating, conductors are matched so that minimum resistance unbalances are obtained.

**CONDUCTOR INSULATION**
High quality insulating polyethylene offers mechanical protection and excellent insulation resistance along with lower carrier frequency transmission losses as compared with paper insulated cables.

**COMPOSITE GROUPS**
Different gauges are separated by polyethylene tape.

## *All 8 points prove highest transmission efficiency!*

SUPERIOR'S *New* Toll Cable is quality-engineered throughout the manufacturing process . . . then finally tested to assure highest transmission efficiency!

This all-plastic insulated and sheathed cable permits greater spacing of repeaters because it maintains lower carrier frequency transmission losses as compared with paper cables.

SUPERIOR Toll Cable provides improved lightning protection . . . is resistant to moisture, ozone, alkalis, oils and acids . . . should eliminate the need to maintain toll and trunk cable under gas pressure.

For greater service reliability and highest transmission efficiency, use SUPERIOR Toll Cable!

INDEPENDENT

*Tell us the nature of your transmission requirements — Quadded — Composite — Exchange . . . we'll build the cable to meet your needs!*

**SUPERIOR CABLE**

**SUPERIOR CABLE CORPORATION • Hickory, North Carolina**

## Section 27 (continued)

### Reprinted from "Someone To Talk To" By Gretta Palmer

#### Rules for Skillful Listening

With this insight into conversation, your own and others', you can examine the rules for good and skillful listening. Remember that no one expects you to practice them all the time. You are human, too. You sometimes need to do the talking. But, there are times when it is evident that someone around you—a husband, a child, a friend—is in need of getting something "off his chest." That's the moment to apply as many of the rules of helpful listening as you are able to:

(1) You'll get better with practice at recognizing situations that call for wholehearted listening; whenever an unreasonably violent remark is made, it's a good bet that the speaker would like to "blow his top." Don't answer him sharply or try to show him how unreasonable his statements have been. He can't be reasonable until he gets this thing off his mind.

If you have no time to settle down and help him, then and there, get away as quickly as possible and hope that someone else will be able to take on the job. If you have time, look upon this as a chance to do a very real service for somebody. Remember that many a person, after just such simple experiences of talking it out, has enjoyed his first good night's sleep in years.

(2) It doesn't matter in the least whether you are qualified to "advise" this person on whatever is troubling him; advising is something you will, at all costs, avoid. Don't tell him that you are now prepared to listen; just sit quietly and let events take their course and he will pour out his soul.

The attitude with which to start was well expressed by a counselor in a USO canteen who was told of an appalling tragedy by a soldier she had never seen before. "I didn't know what to say," she said, "so I just lent this boy my ears and my heart."

(3) When you have embarked on a conversation, always be quite clear in your mind on whether you are trying to help the other person or are merely



exchanging views for everybody's equal enjoyment. Otherwise, in the midst of a talk that is very helpful to the other person, you may say to yourself, "Hey, what's this? When do I get a chance to talk?" The answer is, you don't. When you've started to help someone by listening, your own worries and even your cleverest comments on his difficulties must be set aside for some other time. Good, helpful listening is utterly unselfish.

(4) Since this is the talker's hour, you must let him run the conversation. This means that you can never probe, never ask a question to get information you may think necessary to judge things fairly. Judging is not your task, so curb your curiosity—otherwise the talker might tell you things he would later regret having said. The only questions permitted a listener who is really on the job is to repeat, in another form, what the speaker has already said. For instance, it may be helpful to say, "So you're fully determined to give up your job?" or, "Then you don't see anything good about her?" . . .

(5) Don't cut off the expression of feelings the speaker has begun, no matter how much they may appall you. If a man bangs the table and pours out an unreasonable hatred of someone, by all means let him bang away; if you interfere by saying, "You shouldn't feel that way," you will only succeed in bottling up this anger inside of himself—the last place in the world you want it to be stored. Let it come out.

If a woman cries and sobs, the good listener will never try to stop her by a shortsighted comforting. To say, "Don't cry. Everything will work out somehow;" or "Hush now. You're making yourself sick" is a refusal to continue listening. A "good cry" is exactly what she wants and needs—let her have it out.

(6) A real faith in the other person's ability to work his own way toward light and air and hope is necessary, if we are to keep still. Try to develop it. Dr. Carl Roger, of the University of Chicago, reports that such faith is invariably justified; "When the individual's negative feelings have been quite fully expressed, they are followed by the faint and tentative expressions of the positive impulses which make for growth. There is nothing which gives more surprise to the beginner than to find that this positive expression is one of the most certain and predictable aspects of the whole process.



The more violent and deep the negative expressions, the more certain are the positive expressions of love, of fundamental self-respect, of the desire to be mature."

There are thousands of case histories to prove this point. There are cases of AWOL soldiers, interviewed during the war, who began the talk with the defiant words, "I won't go back," and ended them, after no interfering advice, with the words, "Of course, I know I'll have to return and face the music."

There are cases of women who said, "Don't try to argue me out of getting a divorce. My mind is made up." Forty-five minutes later, after their own uninterrupted talk, they have said, "A divorce is no solution."

In these and in other successful counseling interviews the listener would have bitten off his tongue rather than try to push the talker toward such a decision. Silence is hard for a listener; its practice is at war with the tendency to "set things right" which makes busybodies of us all. When a husband is discouraged, a wife's impulse is to rush to his side with soothing words; she longs to stop his silly talk about being a failure. Naturally she does.

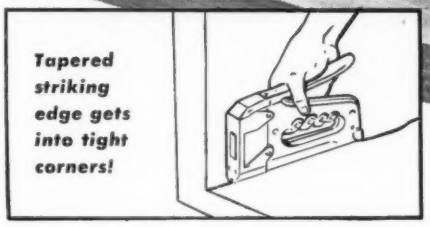
When a child sobs that he would like to kill some teacher, it is hard for a mother not to say, "Hush. You mustn't say things like that." But, in either case, the woman will be much more helpful if she holds back her words until the talker has run down. And by that time they won't be needed; the mere expression of such views, the mere getting rid of them, allows the talker to begin to think in happier and more friendly terms.

(7) While all this violent or unhappy talk is going on, what should we say? One expert recommends a series of "eloquent and encouraging grunts." Counselors are trained to insert such little comments as, "I see," "Um-m-m-m," "That's how you feel," "I think I understand." But if the talker gets stuck and cannot go on—although he evidently wants to—a few seconds of silence do no harm. The "expectant pause" is one of the ways by which we can indicate our sympathetic willingness to hear more—along with our acceptance of the fact that the talker doesn't have to tell us anything. This conversation is his show, not ours; so long as the listener keeps that fact well in mind, his responses will be in the proper key.

*(Section 27 to be continued next week)*

# One Arrow staple gun fastens them all!

**ONLY ARROW'S T-25 STAPLE GUN TAKES 3 STAPLE SIZES TO FASTEN ANY INSIDE OR OUTSIDE WIRE UP TO ¼" DIAMETER!**



*Tapered striking edge gets into tight corners!*

- T-25 staple gun holds ⅜", 7/16", and 9/16" round crown, rust resistant staples, a full ¼" in width.
- Safe! No short circuits possible automatic mechanism stops staple at right height.
- Short span handle provides comfortable grip – minimizes fatigue.
- Arrow tackers are jam-proof! Can't jam even when struck against metal! Never any lost time on the job. Fully guaranteed
- No wire sag ever! If staple used doesn't hold wire taut, simply use next shorter leg length to insure firm hold and neat job.
- Staple leg lengths are long enough to insure firm hold in wood, plaster or composition board, etc. Tack-pointed staple legs diverge to give even greater holding power.
- Check staple supply in tacker simply by looking on underside of gun.

T 25 LIST PRICE **$15.00**

**Try Arrow without obligation!**

**Tackers will be sent on approval for testing purposes. Send request to Telephone Division.**

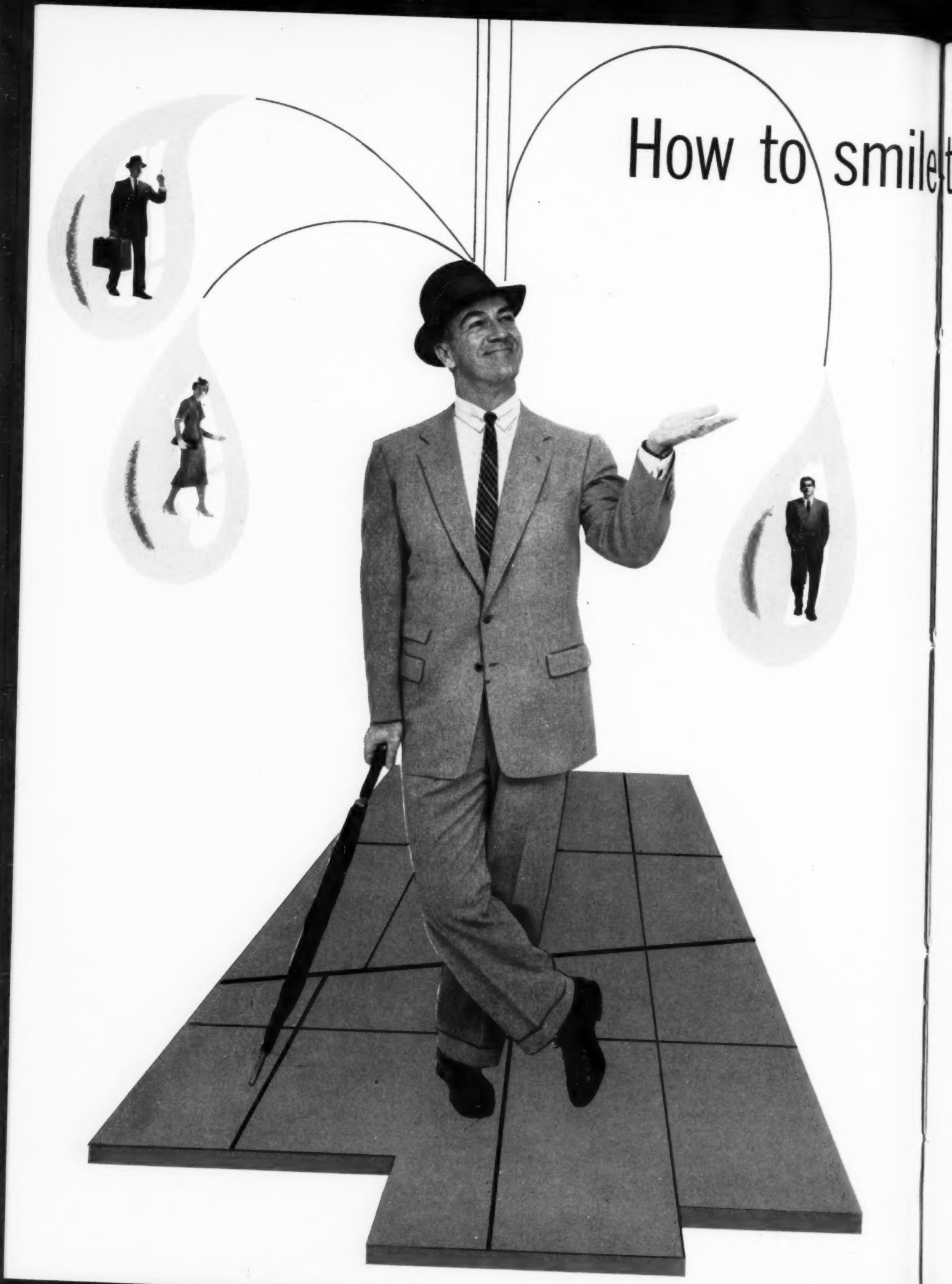
*Available at your regular supply house. Priced for volume use!*

**ARROW T-75 FOR ANY INSIDE OR OUTSIDE CABLE UP TO ½" IN DIAMETER!**

- T-75 tacker holds 9/16", ⅝" and ⅞" tack-pointed, rosin-coated staples, a full ½" in width
- Fastens 21 pair inside wiring cable, 26 pair, 12 pair wires, etc.
- Has all above mentioned Arrow features (except tapered head) to insure maximum speed and efficiency of operation!

T-75 LIST PRICE: **$15.00**

**ARROW FASTENER CO. INC.** 1 Junius Street, Brooklyn 12, N. Y.


How to smile

# ile through a rain of new customers

**When new people start moving to your town in droves—that's when you're glad you bought Strowger Automatic! Strowger expansion is simple as 1-2-3:**

**HANDY EXTRA BANKS** 1

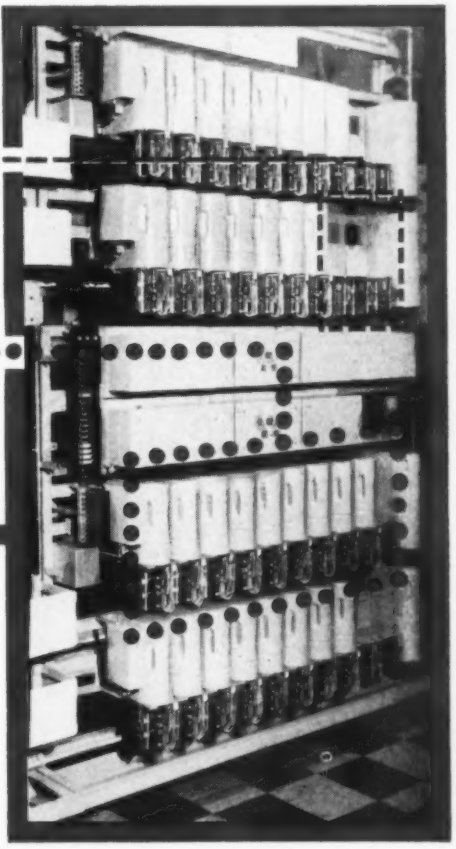
take care of moderate growth. Merely jack in another switch and you give a healthy boost to your traffic capacity.

**PRE-WIRED SHELVES** 2

handle larger expansion with a minimum of work and expense. All you do is slip them into place and connect a cable.

**COMPLETE PRE-WIRED FRAMES** 3

can be added to meet the largest growth requirements. There are no capacity limits to Strowger expansion.



**BEFORE YOU INVEST,** we suggest you pick out a few Strowger owners at random. Ask them precisely what expansion they've had, whether the job was easy, and what it cost. Get the facts and figures—convince yourself. Then contact your friendly Automatic representative. He'll be happy to give you further information—plus any engineering assistance you need. (A quote too, if you wish!)
Address: *Automatic Electric Sales Corporation,*
*1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

# Small Companies Under the Federal Wage-Hour Law

**Provisions of act affecting employes are explained in this exclusive article by Wage and Hour Division.**

EMPLOYES of telephone companies, regardless of the size of the firm, are generally covered by the Fair Labor Standards Act—the Federal Wage and Hour Law. This is because the act applies to employes who are engaged in interstate commerce.

Unless specifically exempt, covered employes are entitled to a minimum wage of $1.00 an hour and at least one and one-half times their regular rate of pay for all hours worked over 40 a workweek. They also come within the law's child-labor provisions.

### *Operator Exemption*

Most small telephone companies are aware that the law provides a year-round minimum wage and overtime pay exemption for any switchboard operator employed in a public telephone exchange which has no more than 750 stations. This exemption, it should be noted, applies only to switchboard operators, not to the company's other employes.

*Tolerance for Non-exempt Work.* Activities performed by a telephone company employe which are not connected with or incidental to the providing of operator services to subscribers of the exchange where the employe works are non-exempt. The exemption does not apply to an employe who spends more than 20 per cent of his time in any workweek in non-exempt work, even though the remainder of his time is spent in operating the switchboard of an exchange which meets the 750-station test.

A switchboard operator may perform various activities which are a normal incident to the operation of a switchboard and, therefore, are not considered non-exempt work. Examples of such incidental activities include clerical work in connection with subscribers' long distance calls or telegrams, secretarial services performed by the operators for subscribers through the use of the switchboard itself, the making of minor repairs, the testing of lines with linemen, the billing of customers and the collection of bills from customers at the exchange.

*How to Count Stations.* To apply the exemption properly, the employer must be sure he knows what to count toward the 750-station limit. A station is a telephone transmitting and receiving instrument in service and includes extension telephones and telephones for which switching service is provided. All stations are counted for which the exchange provides operator switchboard service directly, including stations on other exchanges for which services are furnished which are not incidental to the providing of operator service for subscribers of the operator's own exchange.

This means that the telephone company must count those stations for which the exchange furnishes toll, information and assistance services only, even though automatic equipment located in the same or a different exchange provides the remainder of the necessary services to such stations.

A few illustrations will serve to bring out clearly the principles just given. For illustration purposes, it is assumed that the operators perform no services for stations on other exchanges except those stated in the example.

Exchange A has 620 stations and is manually operated. It has direct connection with the toll center. Exchange B is an automatic exchange with 700 stations and lacks direct connections with the toll center. When subscribers of Exchange B make long distance calls, they dial the switchboard at Exchange A and the operator at Exchange A switches the call through to the toll center. Since the handling of such calls by the operator of Exchange A has no relation to the services she provides for the subscribers of her own exchange, the stations on Exchange B must be included with those of Exchange A when counting the number of stations. As the total number of stations of the exchanges exceeds 750, the operator of Exchange A will not be exempt.

Exchange A has 620 stations and is manually operated. Exchange B is an automatic exchange with 700 stations. A dial is installed in Exchange A for the sole purpose of furnishing service on calls between subscribers of the two exchanges. The operator of Exchange A will report to a dial subscriber on Exchange B that the telephone of a subscriber to Exchange A is busy, or does not answer. Or a subscriber on Exchange B may call for a subscriber on Exchange A by name instead of by number. Since these kinds of activities are a necessary part of the services the Exchange A operator performs for subscribers of her own exchange, the Exchange B stations are not counted in determining her status and she will, accordingly, be exempt.

Exchange A is manually operated and has 620 stations. Exchange B is also manually operated and has 800 stations. Toll calls to and from Exchange B are routed by its operator through Exchange A. In these circumstances the switching and handling of toll calls by the Exchange A operator are services performed for Exchange B rather than for the stations served by Exchange B. Therefore, the stations on Exchange B need not be counted in determining the number of stations served by the Exchange A operator. However, since the Exchange A operator's activities in switching and handling toll calls for Exchange B have no connection with services for subscribers of her own exchange, such activities are considered non-exempt work. If such activities, together with any other non-exempt activities performed by the Exchange A operator, fall within the 20 per cent tolerance explained above, the operator will be exempt, since her exchange meets the 750-station test.

The exemption applies on a workweek basis. Accordingly, if the exchange has more than 750 stations in one workweek and less than 750 stations in the succeeding workweek, its operator will be exempt during the second workweek only. The employer would have to pay her in accordance with the statutory minimum wage and

# ESCO RINGING EQUIPMENT

MEMBER

**ADDITIONAL ESCO FEATURES (details in future ads pictured on the dial) — further explain why Esco components are included in installations of prominent suppliers like Automatic Electric Co., Federal Telephone and Radio Corp., Kellogg Switchboard and Supply Co., Leich Sales Corp., and Stromberg-Carlson Co.**

## permanent, precise alignment gives a quieter, smoother drive

The whispering-soft, velvet-smooth operation of an ESCO ringing assembly comes from its unique drive design. To begin with, motors and driven units are factory mounted in precise alignment. They never need to be touched again, even to change belts. An idler pulley provides initial belt tension. To change belts, it is only necessary to loosen the idler pulley, remove old belts from the sheaves, and replace with new ones. By keeping accurate alignment, belts last longer.

Less friction, lighter bearing loads, and less driving power are some mechanical advantages of this outstanding drive system. They add up to longer life, smoother operation and less maintenance for you.

But care and attention to important details like this is just one of many reasons why ESCO is preferred by engineers, suppliers, and users alike. The full facts are yours for the asking in our new brochure, ESCO RINGING EQUPMENT. Send for it today.

*Write today for full information*

**ELECTRIC SPECIALTY CO.**
**176 South Street, Stamford, Connecticut**

overtime pay requirements for her work performed in the first week.

### *White-Collar Exemptions*

Some small telephone companies have employes who come within the minimum wage and overtime pay exemption the law provides for those engaged in a bona fide executive or administrative capacity, as these terms are defined in the Wage and Hour Divisions' regulations, Part 541. Every firm that is interested in this exemption should note that no worker is an exempt "executive" or "administrative" employe merely because he has the job title of manager or foreman, or because he is paid a good salary.

Among the basic requirements for exemption of an executive is that his *primary* duty must be the management of the enterprise, or a recognized department or sub-division. In the case of the administrative employe, one of the basic tests is that he *primarily* perform office or non-manual field work of substantial importance to the management or operation of the business. Employers who believe they have employes in these categories should carefully check all the tests on duties and responsibilities as contained in the Wage and Hour regulations before taking the exemption.

There are also salary tests for the exemption of executive and administrative employes. For the executive exemption, the employe must be paid on a salary basis of at least $55 a week (or $238.33 a month). For administrative employes, the test is $75 a week (or $325 a month) on a salary or fee basis. There are shorter-duties tests for exemption of executive and administrative employes who are paid on a salary basis of at least $100 a week. These tests are also contained in regulations, Part 541, which may be obtained free from the Wage and Hour Divisions.

### *Overtime Pay Computation*

To compute overtime pay for non-exempt employes, the employer must first know how to determine the worker's regular rate, since overtime pay must be computed at time and one-half the regular rate for all hours worked over 40 a week. Of course, the regular rate may be more than the $1.00-an-hour minimum wage, but it cannot be less.

Here are rules for figuring the regular rate in some typical situations, assuming that an employe receives no other compensation: (1) The regular rate of a worker paid at an hourly rate is that hourly rate; (2) the regular rate of an employe paid a salary for a specified number of hours a week is obtained by dividing the specified weekly hours by the salary; (3) where a salary is paid as straight-time pay for whatever number of hours are worked in a workweek, the regular rate is obtained by dividing the salary by the hours actually worked each week.

If a salary is paid on other than a weekly basis, the weekly pay must ordinarily be determined in order to compute the regular rate and overtime pay. For instance, a monthly salary should be multiplied by 12 and the product divided by 52 to get the weekly pay.

### *Child Labor Prohibited*

No one under the age of 16 may be employed as a switchboard operator. Young people of 14 and 15 may work at office jobs, outside school hours and under strict limitations as to hours of work.

A minimum age of 18 years applies to occupations which the Secretary of Labor has declared hazardous. Telephone companies should note that the occupation of motor-vehicle driver or driver's helper is prohibited to minors under 18.

Employers can protect themselves against unintentional violation of the child-labor provisions by requiring and keeping on file a certificate of age for each young employe. Certificates issued under state child-labor laws are accepted as proof of age in all states except Idaho, Mississippi, South Carolina and Texas, where federal certificates are issued.

### *Records Must Be Kept*

Employers are required to keep records on wages, hours and certain other specified items that most employers keep for their own information. No special form or order for the records is necessary. Records to be maintained for exempt employes differ from those required for non-exempt workers. Complete information on what data should be recorded is available in the Wage and Hour Divisions' record-keeping regulations, Part 516. These may be obtained free from the divisions.

### *Poster Must Be Displayed*

Firms that have covered employes are required to display a poster where the workers can readily see it. This poster, which briefly outlines the law's provisions, may be obtained free from the divisions.

### *Employes May Recover Back Pay*

The Federal Wage and Hour Law provides three methods by which employes may recover back wages owed: (1) The divisions' administrator may supervise the payment of back wages; (2) on the written request of employes, the Secretary of Labor may bring suit in certain circumstances against employers to recover back wages; (3) employes may bring suit to recover back pay and liquidated damages equal in amount to the wages withheld, plus attorney's fees and court costs.

The employe may not bring suit or recover liquidated damages if he has been paid back wages under the administrator's supervision, or if the secretary sued for him.

### *Where to Get Information*

The division's regional or field offices will gladly answer all requests for more information about any requirements of the Federal Wage and Hour Law. Regional offices are located in Boston, New York, Philadelphia, Birmingham, Cleveland, Chicago, Kansas City, Dallas, San Francisco, and Nashville. There is at least one field office in every state.

## Two N. Y. Companies Close Loans with Berkshire Life

Dundee (N. Y.) Telephone & Telegraph Co. has closed a 25-year first mortgage loan in the amount of $135,000 with Berkshire Life Insurance Co., Pittsfield, Mass., it was announced on Jan. 29 (TELEPHONY, Nov. 17, p. 55).

Proceeds of the loan are being used to refund debt and to fund notes payable incurred for property additions.

The loan was Berkshire's 48th piece of Independent telephone financing.

*

Sylvan Lake Telephone Co., Hopewell Junction, N. Y., has closed a $175,000 25-year first mortgage loan, also with the Berkshire Life Insurance Co. Announcement was made on Jan. 29.

Proceeds of the loan are being used for refunding of debt, plant additions in connection with extended area service, and additional working capital.

The loan, Berkshire's 49th piece of Independent telephone financing, was its second loan to the Sylvan Lake company.

## Terse Truth

In the view of Herbert Hoover, "the greatest issue in America and all mankind is the encroachments of government to master our lives." That single brief sentence says more than a hundred windy political speeches—or tortuously phrased partisan platforms designed to offer all things to all men. Those who look to government for doles, for favors, for special privileges, for cradle-to-the-grave security, will find that government will demand the death of liberty in return. Then we will have the security of the prison.—*Industrial News Review.*

# 3 BENEFITS a FITCHBURG CHIPPER brings to your line clearance operation

## New Jersey Bell Telephone, Vineland, praises Fitchburg Chippers

NEW JERSEY BELL TELEPHONE COMPANY

17 LANDIS AVE.

VINELAND, N. J.

S. B. DUBIVSKY
DISTRICT PLANT SUPERINTENDENT

July 28, 1955

Mr. W. O. Forman, President
Fitchburg Engineering Corporation
Fitchburg, Mass.

Dear Sir:

Line clearance work in this part of New Jersey is of such proportions that disposal of brush is a continuing problem of expense and maintenance of good public relations.

We are glad to report that, in our opinion, the Fitchburg Chipper does the job at low cost and eliminates many of the problems which accompanied the loading, hauling, dumping or burning of brush and cuttings.

Chipping, as a method of disposal, has produced a favorable reaction in the attitude of governing bodies and the general public which we hope will continue to operate to our advantage in securing and maintaining line clearance.

The chipper has also produced an important dividend in the reduction of possibility of accident arising from multiple handling and disposal. In this connection, we are favorably impressed with those design features of the Fitchburg Chipper which provide for the safety of operating personnel.

Very truly yours,

S. B. Dubivsky
District Plant Superintendent

sbd-a

**FITCHBURG ENGINEERING CORPORATION**

FITCHBURG, MASSACHUSETTS

You'll be interested in how the 3 big Fitchburg Chipper benefits listed below apply to your operation. Read what New Jersey Bell Telephone, Vineland, says about their experience.

**1 Low cost brush disposal.** Fitchburg Chippers help get your line clearance job done with fewer men, less equipment, less cost. No more loading, hauling, dumping, burning. Chips are blown to side of road or right of way.

**2 Good public relations.** Wood chips provide a neat, organic soil dressing that stays in place—helps keep up roadside appearance, keep down weeds. Where chips cannot be left on job-site, most crews give chips to the nearest farmer or gardener for use as valuable mulch.

**3 Safety in operation.** The Fitchburg Safety Spring, or spring-loaded feed plate not only assures equal ease in chipping all sizes of wood to the machine's rated capacity; it also provides an added safety factor—aids in protecting the operator in case metal or foreign material is accidentally fed into the machine.

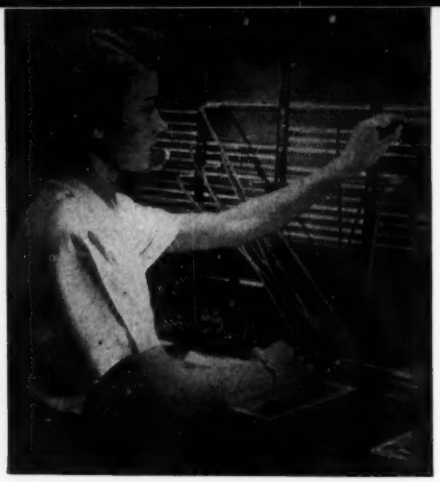
### NEW FREE BOOKLET

Complete cutaway color drawings, photographs, specifications, and photo copies of letters from satisfied users.

**FITCHBURG ENGINEERING CORPORATION**
Fitchburg, Mass., Dept. T-17
Send free copy of "Chipper Talk" to:

Name.....
Position.....
Company.....
City or Town.....State.....

BUFFALO AND ERIE COUNTY PUBLIC LIBRARY



# THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

WHILE ATTENDING a dinner party the other evening, I met an old-time resident of my home town whom I had known by name for many years, being a prominent businessman in my community, but whom I had not had the pleasure of meeting before. When he learned I was an old-timer in the telephone industry, he proceeded to relate an experience which occurred in Springfield not too many years after the invention of the telephone.

The gentleman asked if I were familiar with a certain drugstore located directly across from the Leland Hotel, now occupied by a cleaning establishment. I said, "Heavens, no, I'm not *that* old." (The drugstore was in operation in 1880.) "If my father were living," I said, "he would remember, because if he were living he would be 112 years old."

He laughed and said, "Truthfully, it was *my* father who related this experience to *me*. It seems there was a man on the roof of the Leland Hotel, with a wire strung down to the ground, and he talked to another man stationed there. The druggist, skeptical because the two demonstrators were also salesmen trying to sell stock in the telephone company, stated, 'They are using signals. I think the whole thing is a fake.'

"A young lad employed in the drugstore who had been thrifty and saved $500 over a period of years said, 'I don't think it is a fake and I am going to invest my $500 in telephone stock.' The druggist said, 'Boy, you're crazy and if you do that, you're fired!' The young man invested his money, and he was promptly fired by the druggist. But the story has a happy ending—the young man became a millionaire."

This was related to me as a true story, and I am not skeptical, knowing that in the early days of telephony, people generally were dubious about the invention of an instrument that could carry the human voice to distant places. They thought such an apparatus was uncanny and shied away from it.

If we only had time to meet more people, especially older people, we could learn many interesting facts about the telephone. No doubt every community in this great nation has an older resident who could tell an interesting story or experience about telephone service in the early days when the instrument was considered a toy. Today the telephone is not considered as such since it is the medium generally used for communication with people nearby and in far-off places.

The telephone has graduated from the toy stage and is now considered a "luxury" by our government, which taxes us for its use every time we place a long-distance call. When I made this statement to the gentleman at the dinner party, he said, "Luxury, my eye! I couldn't run my business without the telephone. In fact that is where most of my business comes from—people calling on the telephone to order my merchandise."

Business and professional folk, the farmer, and people in all walks of life are dependent upon the telephone in their business and in their everyday life. And yet, they go on, paying a luxury tax, without protest, for a service that is indispensable. I often wonder why.

At the dinner party, going from the subject of the telephone, which was an interesting topic of conversation for some time, a gentleman and his wife, whom I have known for many years, were having a warm discussion about the wife's place of birth. The gentleman said, "Let's ask Mayme where 'Goosetown' is. She should know. How about it Mayme? I contend my wife was born in Goosetown and she insists she wasn't. That her home was East of Goosetown."

I knew I was sticking my neck out to participate in a discussion of this nature, but I threw discretion to the winds and said, "Well, I should know where Goosetown is. I was born there. Your wife was not. She was born on a street beyond the east boundary of Goosetown, and we Goosetownites do not claim anyone outside of our boundary."

"Bravo", said the wife. "Now don't you ever tell anyone again that I was born in Goosetown."

"Now just a minute," said I. "We Goosetownites are proud of our locality and believe you missed something by not being born there. I'll bet you don't know why it was called Goosetown. When I was a youngster, everyone in that locality owned geese, and in those days, geese were not to be scoffed at. You have never experienced a real thrill unless you have encountered a gander on the sidewalk who suddenly decides—You shall not pass!" This amused her husband, and now his wife is undecided whether it was an honor, or vice versa, to have been born in Goosetown.

And so the evening wore on, and it was a pleasant one, because with the advent of radio and television, the pleasant art of conversation is frequently forgotten. The food was delicious, the people were human and charming, and I am looking forward to a similar evening in the near future.

## Traffic Questions

(1) In quoting time and charge on a call from a PBX, if the calling number on the ticket differs slightly from the number given to the Toll Auxiliary Operator, if the operator is not sure she has the right ticket, should she ask if it covers the call in question before quoting the information requested?

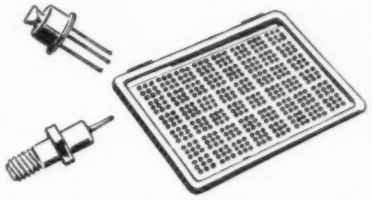
(2) If a distant operator reaches a Toll Auxiliary Operator for the charge on an Outward Collect Call, how should her request be acknowledged?

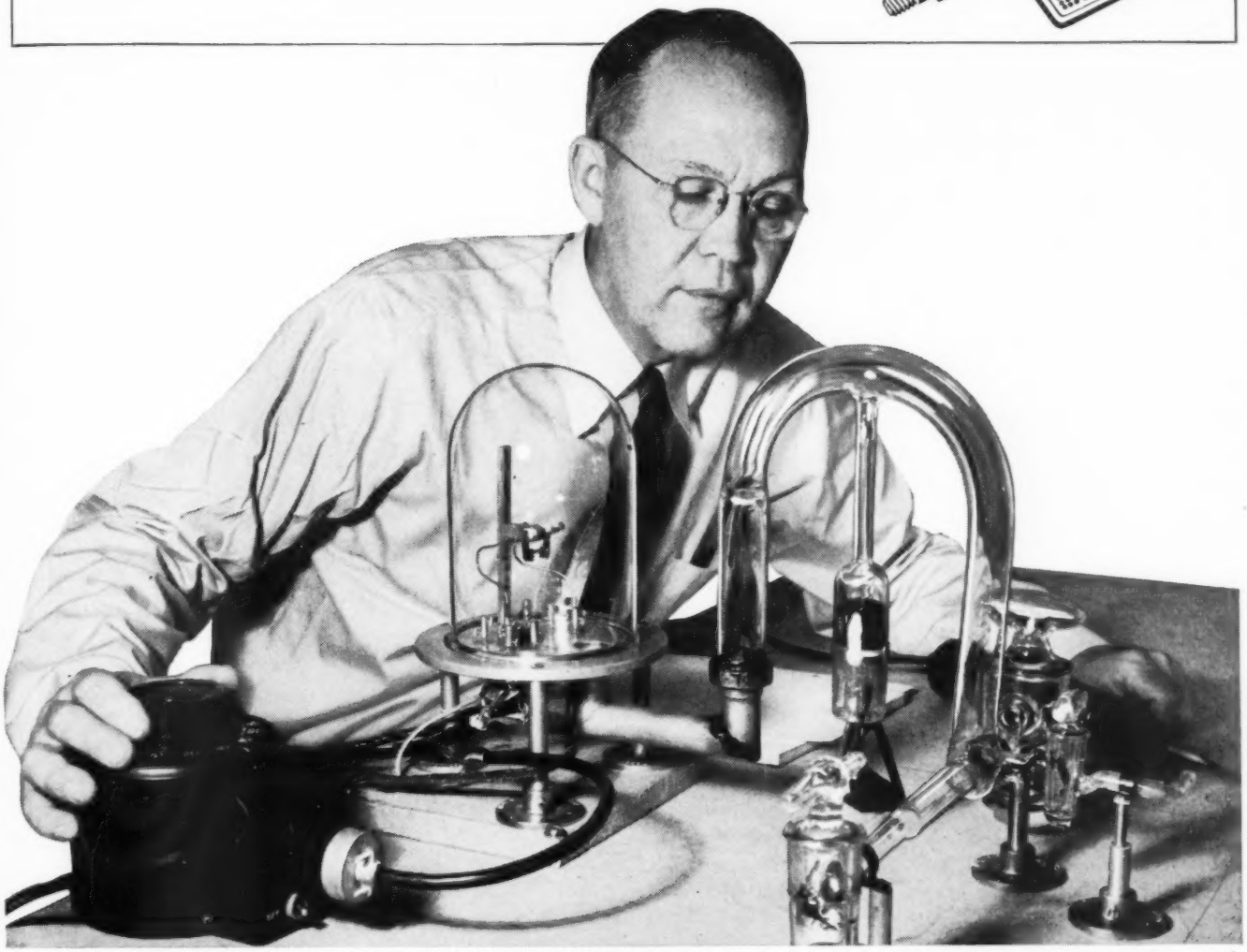
(3) What action is taken by the Toll Auxiliary Operator when she locates the ticket after passing the report, "LK ticket?"

(4) When a customer disputes the charge or the time, what action should

*(Please turn to page 42)*

# New technique shapes future of transistors...
# LEADS TO THREE MAJOR INVENTIONS





Calvin S. Fuller, Ph.D. in Physical Chemistry from the University of Chicago, is a pioneer in development of the diffusion technique. Here he controls a heating current through a strip of silicon while diffusing into its surface a film of aluminum less than 1/50th of a hair's breadth in thickness.

Transistor makers have a very difficult problem. They must add a mere trace of an "impurity" to a semiconducting metal. But they must add it only in very thin layers, without affecting the bulk of the material.

Bell Laboratories scientists developed an efficient new way to produce such layers. They expose the metal to a hot gas containing the impurity. Atoms bombard the surface and—through a process known as "diffusion"—force their way into the metal to form a microscopic film which can be controlled in thickness to a few millionths of an inch.

The diffusion technique opened the way to three major Bell Laboratories inventions in the semiconductor field: the Bell Solar Battery, Silicon Power Rectifier and the Diffused Base Transistor. Right now the technique is providing a key to many other developments of great promise for telephony. It is another example of how Bell Labs works to improve telephony through fundamental research in materials.

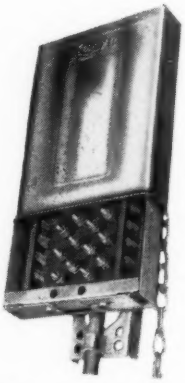
BELL TELEPHONE LABORATORIES

*WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT*

# CLASSICS FROM KELLOGG'S

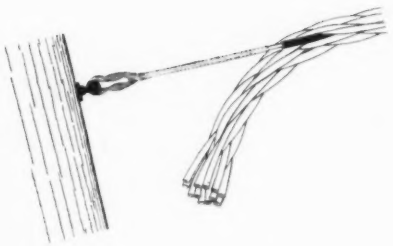
Each one of these line supply items is a classic in its field. These are a few of the many carefully selected items which are available at your near-by Kellogg warehouse or distribution point. Write or phone, today. Prompt delivery is assured.

**Type 775-P Aerial and Duct Cable** gives maximum protection against moisture and weather. Conductors are individually insulated with polyethylene and paired with systematically varying lays to eliminate cross talk. Cable is shielded with aluminum tape and protected by a tough, plasticized polyvinyl chloride jacket. Available in 24, 22 and 19 gauge, 11 through 404 pair. ANSONIA WIRE & CABLE COMPANY.



**The Type XB Unprotected Cable Terminal** features a Bakelite faceplate and insulating fanning strip molded in one piece, with Everdur studs positioned for easy wiring. Available in 6, 11, 16, and 26 pair size, with or without cable stub. COOK ELECTRIC COMPANY.

**Corrosion-Resistant Crapo Stainless Steel Cable Lashing Wire, Type 430,** is available in .045", .065", and .061" diameters. Crapo Galvanized (C Coated) Steel Cable Lashing Wire is available in .091" and .061" diameters. Made by INDIANA STEEL & WIRE CO., INC.

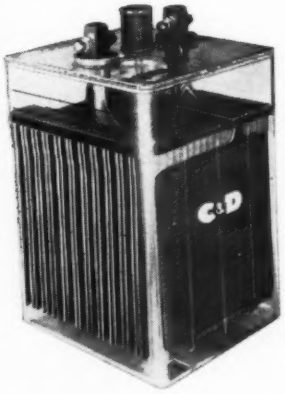


**Preformed Dead-Ends** for Telephone Line Wires and Rural Distribution Cable Messenger. No tolls required, can be installed without cutting wire. Available in galvanized steel, copperweld, stainless steel and bronze. PREFORMED LINE PRODUCTS COMPANY.

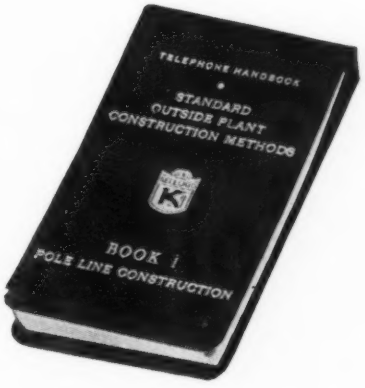
# G'S LIBRARY OF LINE SUPPLIES

**Fine Telephone Poles.** Dierks Pressure-Treated Southern Pine Telephone Poles, up to 110 feet. Creosote or Penta treatment. Prompt shipment out of stock. DIERKS FORESTS, INC.

**Long Service Life and Low Plant Costs** go hand in hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in both Copperweld and Bronze. This flexible and easy-to-handle wire is made by GENERAL INSULATED WIRE WORKS, INC.




**Extra-Long Life!**—The suspended and supported plate construction is an exclusive feature of C&D BATTERIES. Choose C&D PlastiCal (lead-calcium grid) for life expectancy of 25 years . . . for 14 years expectancy, specify PlastiCell (high tensile lead alloy grids). Made by C&D BATTERIES, INC.




**Kellogg's Standard Outside Plant Handbook** now available at special price while quantities last. Reduced to $2.75 a copy, with ten or more copies priced at $2.50 each. Every phase of outside plant telephone pole line construction is covered in book.

**KELLOGG Branch Warehouses and Offices:**

6000 W. 51st Street
Chicago 38, Illinois
REliance 5-5445

4501 Truman Road
Kansas City 1, Missouri
Humboldt 7085

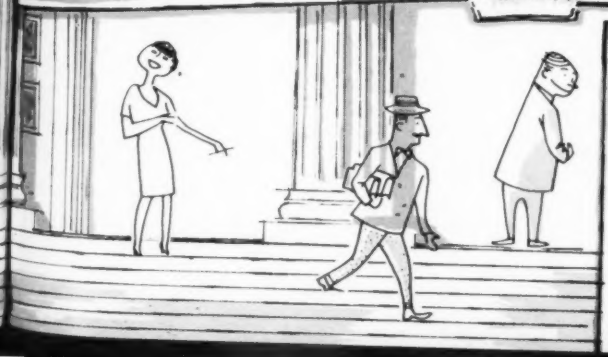
410 N. Syndicate Avenue
St. Paul 4, Minnesota
Nestor 5878

1515 Turtle Creek Blvd.
Dallas 2, Texas
Riverside 7-5191

23 Broderick Road
Burlingame, California
OXford 7-5780

1555 West Fourth Street
Mansfield, Ohio
Mansfield 7-2816

1594 Southland Circle, N.W.
Atlanta, Georgia
Sycamore 4-2441



KELLOGG

A DIVISION OF IT&T

**KELLOGG SWITCHBOARD AND SUPPLY COMPANY**

*A Division of International Telephone and Telegraph Corporation*

**Sales Offices: 79 W. Monroe St., Chicago 3, Ill.**

**Telephone: DEarborn 2-0750**

XUM

"ONE QUICK CUT!
To Clear Lines FASTER!
PORTER PRUNERS
The Quickest and Easiest Way For All Above-The-Ground and On-The-Ground Clearing
Made Rugged — for Rugged Work and long, trouble-free service. Blades are high quality alloy steel forgings that stay sharp longer. Small compact heads for narrow crotches. Fewer working parts. There's over 75 years of cutting "know-how" built into every Porter Pruner.
TYPE RP
TYPE RP POLE PRUNER
Long Arm plus pulley for greater leverage. Light and easy to handle. Capacity 1" green wood. Choice of solid poles (8' to 12') or jointed poles (8' to 16').
NEW TYPE M POLE PRUNER
Economical in cost but perfect in performance. Double steel hook eliminates bending and breaking. Simple mechanism — spring cannot catch or interfere when cutting. Capacity 1" green wood. Choice of poles as above.
THE FAMOUS FORESTER HEAVY DUTY BRUSH CUTTER
Faster and safer for clearing brush & cutting roots. The only cutter with the exclusive slide shift which increases power during cutting operations. Comes in two sizes. Cuts up to 2" green wood and leaves flush, flat-topped stumps.
TYPE M
FORESTER
Your Company can profit by the use of Porter Pruners
Porter Pruners
See them all in the Porter Catalog. Write for it today.
H. K. PORTER, INC.
Somerville 43, Massachusetts


be taken by the Toll Auxiliary Operator?

(5) How will the ticket be disposed of when the action given in answer no. 4 has been taken?

*Answers are presented on page 53.*

## More Light Shed on First Telephone in South

Another letter, well-documented, regarding the site and date of the first telephone in the South has been received by TELEPHONY, the latest one challenging the stand of a letter appearing in the Dec. 29, 1956 issue, page 34. The earlier letter indicated that a type of telephone that had been exhibited first at the New York Industrial Fair in 1879 was seen later by Charles Reid in Seneca, Ga. in 1881, the first such installation in the South.

Mary S. Smith, assistant secretary of the Southern Bell Telephone & Telegraph Co., included in the second letter two reprints from *The Southern Herald of the Telephone*, dated April 1879 in Richmond, Va. She stated in part:

"As you know Mr. Bell received his first patent on the 'speaking telephone' Mar. 7, 1876. This was exhibited at the Philadelphia Centennial in June of that year and early in 1877 Mr. Bell and associates began the manufacture of instruments.

"In May 1877 the first telephone advertisement appeared offering 'Telephones for the transmission of articulate speech through instruments not more than 20 miles apart.'

"This was private line service and was the only type of service available until the appearance of the first commercial switchboard in New Haven, Conn. on Jan. 28, 1878—this, of course, inaugurated 'exchange' or 'central office' service which provided intercommunication to telephone subscribers and was the first step forward in establishing the telephone as an integral part of our social and economic life.

"At once exchanges began to spring up as fast as manufacturers could supply equipment. The first exchange in the South opened in Nashville, Tenn. on Dec. 12, 1878; this was followed by Louisville, Ky. on Feb. 1, 1879; New Orleans, La. on Mar. 15, 1879; Richmond, Va. on Apr. 1, 1879 and Atlanta, Ga. in May 1879. Atlanta, by the way, had a private line in its Western & Atlantic Railroad depot as early as 1877.

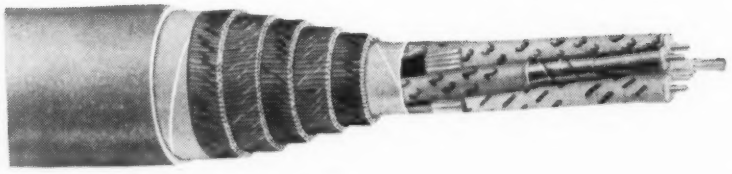
"For such interest as it may have for you I enclose a few sheets of a trade journal called *The Southern Herald of The Telephone*, Vol. I, No. 1, dated April 1879 and published at Richmond, Va.; included is the full page advertisement of the Richmond telephonic exchange.

"The Southern Bell Telephone & Telegraph Co. was chartered Dec. 20, 1879 and its annual report for 1880 lists 20 operating exchanges."

## Diminished Stature

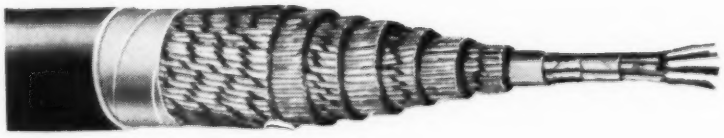
"A state which dwarfs its men in order that they may be more docile instruments in its hands, even for beneficial purposes, will find that with small men no great thing can really be accomplished."—JOHN STUART MILL.

**Richard Dunfee, switchman of the Elyria (O.) Telephone Co., explains a point to Chung Doh Kil of Seoul. The Korean engineer is here in the United States for a year under the auspices of the International Cooperation Administration, studying telephone operating methods. He has now joined The Elyria company as an honorary employe. He will study communications work in all its phases, and expects to spend six months or more in Elyria. He is a graduate of Seoul Engineering College. With his engineering background, augmented by the technical communications knowledge secured in the United States, he will return to Korea to take a post under the ministry of communications and use his new know-how toward improvement and expansion of the Korean telephone system.**



*Composite Co-axial and Audio Long Distance Telephone Cable*

*60 Channel 14 Pair Carrier Telephone Cable*



*Paper Covered Audio Star Quad Long Distance Telephone Cable*

**Telephone Cables for every type of LONG DISTANCE SYSTEM designed, manufactured and installed by**

**BICC**

Branches and Agents throughout the World

BI Callender's

*BRITISH INSULATED CALLENDER'S CABLES LIMITED 21 Bloomsbury Street, London, W.C.1*

# construction and maintenance DIGEST

- Wires' Shangri-la
- More protection than ever
- Lead in reserve
- Positive grip
- "Freeze" frequencies

Published regularly to help you get the most out of your materials and supplies dollar

*by Gerald C. Gaydos, Inside Sales—Chicago*

In my spare time I like to do crossword puzzles, but there's never any puzzle about the advantages of ordering supplies from Stromberg-Carlson. No matter where you're located, you're protected by a double guarantee on the fine products you order from Stromberg-Carlson . . . ours, and the maker's. This way, when emergencies make special demands—you're not alone. You find **two** solid companies right beside you, eager to help. That's how our 62-year reputation in the industry has grown. That's why it pays you to order from Stromberg-Carlson—leader in the research for new and better telephone equipment. We'd like you to know we appreciate your support.

### Here's a drop wire that hides its age

Samples of Whitney Blake Teleprene® (neoprene jacketed) drop wires were strung where they would get lots of weather. After nine years, they still looked fresh and undaunted – and tests showed that these wires would give years and years **more** of good service!

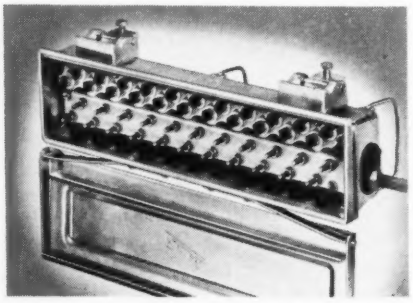
The jacket is a tire-tread type neoprene compound which provides excellent resistance to sunlight, abrasion, oils, acid fumes, alkalies and other corrosive chemicals.

Conductors have Teleplate coating: lead, to resist corrosion, and brass plating over the lead, to provide enduring adherence of the high quality buna rubber insulation to the conductor.

Available in parallel (shown here), twin parallel and twisted pair types.

### Terminal with New Protector

Now get more dependable protection than ever for station or cable—with Reliable Electric Company's strand mounted terminals.



Precision manufactured terminals of highest quality

These terminals are equipped with the new Reliable Fuseless Protector Unit, which dissipates static discharges across elements to ground.

Another important feature is that the silicon bronze binding posts on which cable stubs are terminated are sealed with the wires in a glass-reinforced polyester resin of exceptionally high dielectric qualities.

Surface leakage is minimized or completely eliminated by 1-1/16" spacing of binding posts.

### Reserve lead keeps battery young

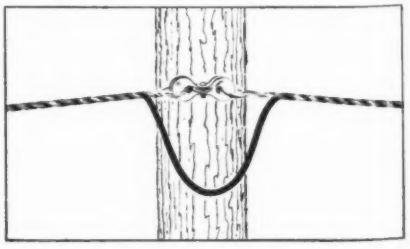
Inside the unique lead buttons in an Exide-Manchex positive plate there's a coil of reserve lead designed to prolong battery life. Over the years, as this lead is needed, it goes into action, instantly and automatically.

The unique thing about Exide-Manchex construction is that the reserve lead does not have to support the plate. The spiral lead buttons are tightly locked into a cast lead-antimony alloy grid several times more rigid than pure lead. Hence the reserve lead can be completely consumed while the plate retains its strength.

Only Exide-Manchex Batteries have this construction. In addition, they feature a plastic jar that saves weight and space, high level electrolyte for less frequent filling, and huge bottom reservoir that virtually insures against sediment shorts.

### Pressure is widely distributed

To provide an even, positive grip, Preformed Dead-Ends for Self-Supporting Plastic Cable are designed so that low radial pressure is distributed over a large area.



Available for 6, 11, 16 and 26 pair 19 AWG Self-Supporting Cable.

You have no high stress points to worry about, and no sharp bends in the cable are required. PLP Dead-Ends hold the full-rated strength of the Self-Supporting Cable and will not damage the outer covering or internal members.

You can easily apply these Dead-Ends by hand, without tools. Simply insert one leg through a standard hardware thimble clevis and wrap the legs around the cable.

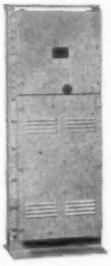
### Converter for harmonic ringing stops frequencies from creeping

Cross-ring in a harmonic ringing system can only be prevented when you find some way to nail down each of the five frequencies—16-2/3, 25, 33-1/3, 50 and 66-2/3 cycles.

If you have looked into this problem, you'll be pleased to know that there is a machine that actually does just that—pins down each frequency and **locks** it by a definite ratio to the 60-cycle input frequency.

This machine is the Lorain H-5 Sub-Cycle. It uses a special principle of operation, making it **impossible** for your ringing frequencies to creep out of line.

Add to this the fact that the H-5 Sub-Cycle provides exceptional voltage regulation—preventing ringing troubles—and you have a very useful machine indeed.



Lorain H-5 Sub-Cycle.

It's economical to operate, too—the H-5 Sub-Cycle has no moving parts, no expendable components. You just install it and forget it. And it requires only 1400 watts power at full load—slightly more than the full load requirement of a 1 H.P. induction motor.

*Distributed by*

**STROMBERG-CARLSON**

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

# Courts and Commissions

## Minnesota Commission OKs Rate Increases for Three

Minnesota's Railroad & Warehouse Commission on Jan. 25 authorized rate increases for the Callaway Telephone Co. and on Jan. 21 did the same for the Ghent Telephone Co. and the Willow Creek Telephone Co.

Total operating revenues and net operating income, both before and after rates take effect, as well as other operating figures are given below for the three companies:

| | Callaway Telephone Co. | Ghent Telephone Co. | Willow Creek Telephone Co.—Amboy and Vernon Center exchanges | |
|---|---|---|---|---|
| *Total Operating Revenues:* | | | | |
| Before | $1,792 | $ 8,286 | $32,937 | |
| After | $2,176 | $10,782 | $43,227 | |
| *Net Operating Income:* | | | | |
| Before | *$ 210 | *$ 184 | $ 2,555 | |
| After | $ 159 | $ 1,285 | $ 6,375 | |
| *Plant Fair Value* | $3,000† | $23,400 | $123,600 | |
| *Rate of Return* | 5.3% | 5.48% | 5.15% | |
| *Stations Served:* | | | | |
| | | | Amboy | Vernon Center |
| Local | 29 | 93 | 268 | 109 |
| Rural | — | 110 | 356 | 112 |
| Switched | 18 | — | 7 | 27 |

* Deficit
† Current Value

## New York Company Requests Issue of 195,312 Shares

Rochester Telephone Corp. asked the New York Public Service Commission for permission to issue 195,312 shares of new common stock to shareholders on the basis of one new share for each five shares held, it was reported on Jan. 29.

The sale would yield proceeds of about 3 million dollars which would be used to repay bank loans used to finance the company's current construction program budgeted at some 14 million dollars this year, up from nearly 10 million dollars in 1956.

The new issue would increase the company's outstanding common stock from 976,562 shares to 1,171,874 shares.

## NLRB Issues Order on Illegal Strike Practices

The National Labor Relations Board at Washington, D. C. has issued an order prohibiting the Communications Workers of America from engaging in illegal strike practices against the Southern Bell Telephone & Telegraph Co. The order, an outgrowth of the CWA strike against Southern Bell in 1955, was announced on Jan. 31, to become effective immediately.

The union in December had agreed to accept such an order without further hearings.

The board's order, which makes provision for court enforcement, orders the union representing Southern Bell employes to refrain from the following violations:

(1) Assaulting, physically harming or otherwise using force or violence against Southern Bell employes and applicants for employment, or attempting or threatening to do so;

(2) Picketing the premises of Southern Bell in such a manner as to keep employes, supervisors and others from entering or leaving the premises;

(3) Making threatening telephone calls to employes;

(4) Following employes, supervisors and others from Southern Bell premises in order to restrain or coerce them;

(5) Throwing objects at, against or toward employes entering or leaving Southern Bell premises or at the premises where the employes are working;

(6) Restraining or coercing Southern Bell employes by damaging or destroying their property or the property of Southern Bell;

(7) In any other manner restraining or coercing employes in the exercise of their rights guaranteed by the National Labor Relations Act.

## Petition Wis. Commission For Authority to Exchange

The Wisconsin Public Service Commission on Jan. 25 received a petition to authorize an exchange whereby the Wisconsin Telephone Co. would trade two of its exchanges for two companies

GENERAL
MACHINE PRODUCTS
COMPANY, INC.
7th & Wood Sts.
Philadelphia 6, Pa.

**MUD BUCKET #G100**

**Patent No. 2,628,121**

The MUD BUCKET is the answer to the utility man's problem when the going is tough. Eliminating the makeshift lard cans, buckets or other receptacles which have to be used whenever water, mud or slush are encountered. Made of sturdy aluminum, the MUD BUCKET has mechanical steel bushing on all pivot points. Tested under the most severe conditions and has proved to be durable and long lived.

**Handles . . . . . 8 ft.**
**Bucket Capacity . . . . . 5 Qts. liquid measure**
**Overall length . . . 9 ft. 1 in.**
**Weight . . . . . 8 lbs. 4 oz.**

Distributed by Graybar

**Over 500 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment**

**SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918**

controlled by Ralph S. Odegard of Menomonee Falls.

Wisconsin Telephone wants to take over operation of the Menomonee Falls and Germantown exchanges of the Menomonee Falls Telephone Co. and the Sussex exchange of the Lisbon Telephone Corp.

To accomplish this, Wisconsin Telephone would trade its exchanges at Stoughton and Evansville to the Menomonee Falls and the Lisbon companies.

Mr. Odegard is president of both companies. Menomonee Falls Telephone Co. has 3,100 subscribers and the Lisbon company 500.

## SW Bell Asks Increase In Rates in Missouri

A proposed increase in Missouri intrastate toll rates of about $1,095,000 was requested of the Missouri Public Service Commission by Southwestern Bell Telephone Co. on Jan. 28.

The company, in filing the new rates, told the commission they were intended to recoup for the company a part of an annual wage increase granted to employes last Nov. 1.

It was estimated the proposed $1,095,000 gross revenue increase annually would be reduced to a net income gain of about $497,000 for the company, after deduction of federal and state income taxes and city gross receipts taxes. These taxes take 54.6 per cent of the gross revenue.

## Ohio Independent Given Approval for Rate Raise

The Mansfield Telephone Co. recently received approval from the Ohio Public Utilities Commission for increased rates. The case was of long standing, the application having been filed Mar. 1, 1955.

The commission found the reconstruction cost new of the company's plant to be $10,345,430 and an existing depreciation amounting to $2,487,651, this making a rate base of $7,857,778. With the setting of an annual rate of return of 6 per cent the company thereby obtained a gross revenue of $2,013,432.02 which amounted to an additional gross annual revenue of $459,032.

One commissioner did not concur with the majority's opinion and followed with a separate opinion.

One of the items at variance was that of depreciation, which the majority opinion discussed as follows:

"The determination of depreciation to meet this requirement is necessarily the judgment figure of experienced engineers and irrespective of how honestly and competently made, the findings may vary widely; in the instant case there is an unusually wide variation. The commission staff found that in addition to wear and tear there was depreciation due to the functional factors of inadequacy, lack of utility and obsolescence. The company's engineers found depreciation for wear and tear only. In view of the evidence it would seem that some depreciation due to other than wear and tear would be apparent."

The company set depreciation as $800,743.00.

The commission staff accounted for depreciation as follows:

| | |
|---|---|
| For wear and tear | $731,934.11 |
| For inadequacy | 877,609.33 |
| For lack of utility | 17,561.20 |
| For obsolescence | 33,882.79 |

The new rates amounting to approximately 22 per cent are as follows:

| | |
|---|---|
| Business, one-party | $11.25 |
| Business, two-party | 10.25 |
| Business, five-party | 9.25 |
| Residence, one-party | 6.50 |
| Residence, four-party | 4.50 |
| Residence, five-party | 4.50 |
| Business, ten-party | 9.25 |
| Residence, ten-party | 4.00 |

## Ohio Independent Authorized To Issue $800,000 Bonds

The Ohio Public Utilities Commission recently authorized the Commonwealth Telephone Co. to issue and sell first mortgage bonds, series 1957, in the amount of $800,000, to bear interest at the rate of 5 per cent per annum, dated Feb. 1, 1957 and to mature Feb. 1, 1979.

The proceeds are to be used to reimburse Commonwealth's treasury for capital expenditures and to retire its presently issued and outstanding short-term notes in the amount of $650,000.

## Wis. Independent Given Authority for Rate Raise

An increase in rates for Wood County Telephone Co., Wisconsin Rapids, amounting to $44,645 was authorized on Jan. 17 by the Wisconsin Public Service Commission.

According to company officials, the increase was requested to "offset wage increases in the last three years."

## Wis. Company Asks Raise

The Wisconsin Public Service Commission on Feb. 5 was to hear the application of the Headwaters Telephone Co. for authority to increase rates at Elcho and Lake Tomahawk.

## Obituary

E. W. BAIRD JR., 59, president of T. J. Cope, Inc., died of pneumonia on Jan. 15 at his Bermuda home. For thirty years he had been sole owner and president of the company.

Mr. Baird served as city treasurer of Philadelphia from 1942-46. In 1944 he was Republican candidate for state treasurer of Pennsylvania.

T. J. Cope has been known to the electrical industry for more than 80 years as a leading supplier of tools and equipment for underground cable installations. In 1948 the company introduced cable trough as an inexpensive method of supporting cables in utilities and industry. Shortly thereafter the Instrof Corp. was established as a separate division to manufacture and sell a similar material for the support of instrument tubing and wiring. The corporation will continue to be operated by present management.

•

EUGENE T. TIPPETT, 56, of Delaware, O., died Jan. 12 after an extended illness.

Mr. Tippett was known throughout the telephone industry. At the time of his death he was head of the office sales department of Buckeye Telephone & Supply Co., Columbus, O. He had also served as a field representative for that company.

Prior to joining Buckeye in 1950, Mr. Tippett was associated with the Transandean Associated, Inc., traveling widely in the United States and South America. Survivors include his widow, a son, a daughter and parents.

## General of the Southeast Makes Four Appointments

H. E. Hussey, chief executive officer of General Telephone Co. of the Southeast, Durham, N. C., on Jan. 29 announced the following appointments:

H. H. Duncan, traffic manager for General of the Southeast at Bluefield, W. Va., since 1950, has been transferred to Durham as general traffic supervisor for the southeastern group of General telephone operating properties and, working under Gordon Saunders of Durham, general commercial and traffic manager, will have direct supervision of traffic activities of group companies located in Georgia, Tennessee, South Carolina, Virginia, West Virginia and North Carolina.

Mr. Duncan is a veteran with more than 24 years experience in the telephone operating field where he has held important positions in telephone accounting and auditing as well as in the traffic department.

L. A. Griffith, also formerly of Blue-


# Standard types of COMMUNICATION EQUIPMENT

Radio Engineering Products is currently producing a number of types of equipment, electrically and mechanically interchangeable with standard Bell System apparatus. Complete equipments of the following types, and components for these equipments are available for early delivery.

**CARRIER-TELEPHONE EQUIPMENT**

C5 Carrier-Telephone Terminal (J68756). A kit for adding a fourth standard toll-grade channel to existing C systems is available.
C1 Carrier-Telephone Repeater (J68757)
121A C Carrier Line Filter and Balancing Panel
H Carrier Line Filter and Balancing Panel (X66217C)

**CARRIER-TELEGRAPH EQUIPMENT**

40C1 Carrier-Telegraph Channel Terminal (J70047C)
140A1 Carrier Supply (J70036A1, etc.)
40AC1 Carrier-Telegraph Terminal
Grid Emission Test Set (J70047D1)

**VOICE-FREQUENCY EQUIPMENT**

V1 Telephone Repeater (J68368F)
Power Supply (J68638A1)
V1 Amplifiers (J68635E2 and J68635A2)
V3 Amplifier (J68649A)
V-F Ringers (J68602, etc.)
Four Wire Terminating Set (J68625G1)
1C Volume Limiter (J68736C)

**D-C TELEGRAPH EQUIPMENT**

16B1 Telegraph Repeater (J70037B)
10E1 Telegraph Repeater (J70021A)
128B2 Teletypewriter Subscriber Set (J70027A)
Composite Sets, several types

**TEST EQUIPMENT**

2A Toll Test Unit (X63699A)
12B, 13A, 30A (J64030A), and 32A (J64032A) Transmission Measuring Sets
111A2 Relay Test Panel (J66118E)
118C2 Telegraph Transmission Measuring Set (J70069K)
163A2 Test Unit (J70045B)
163C1 Test Unit (J70045D)

**COMPONENTS AND ACCESSORIES**

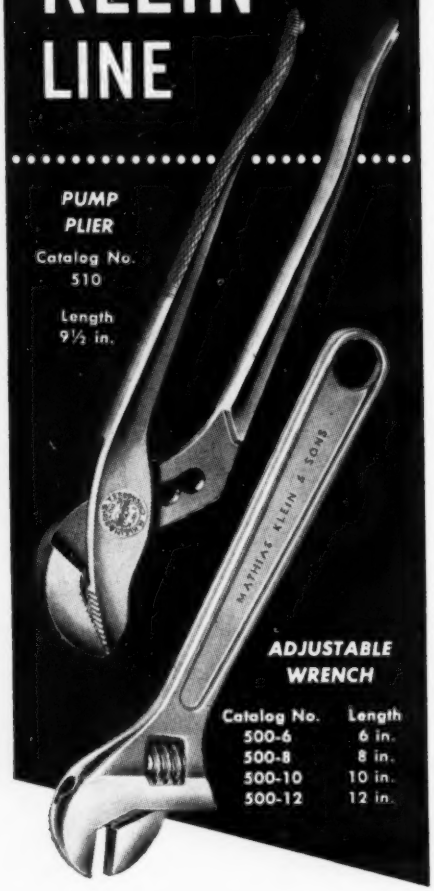
255A and 209FG Polar Relays
Repeating Coils, several types
Retard Coils, several types
184, 185, 230A and 230B Jack Mountings

**VACUUM TUBES**

| | | |
|---|---|---|
| 101D, F & L | 323A & B | 396A |
| 102D, F & L | 328A | 398A |
| 104D | 329A | 399B |
| 205D | 336A | 400A |
| 274A & B | 350A & B | 408A |
| 281A | 355A | 120A Ballast Lamp |
| 305A | 393A | 121A Ballast Lamp |
| 310A & B | 394A | |

**RADIO ENGINEERING PRODUCTS**
1080 UNIVERSITY ST., MONTREAL 3, CANADA
TELEPHONE UNiversity 6-6887
CABLES RADENPRO, MONTREAL

2 NEW PRODUCTS in the KLEIN LINE




These new high-quality tools have been added to the Klein line.

A Pump Plier that gives easy one-hand operation and a firm grip in any of four positions.

And the new Klein Adjustable Wrenches of drop-forged alloy steel, light in weight, chrome plated for lasting protection and service.

**Write for Bulletin**

Bulletin No. 1157 on these two Klein tools is now available. Send for your copy.

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS


field, has joined the engineering staff of General Telephone Co. of the Southeast as a central office equipment engineer, reporting directly to R. Rummelt, general equipment engineer. In his new position, Mr. Griffith will assist in performing the equipment engineering for telephone exchanges of the group companies located in Tennessee, Virginia, West Virginia, Georgia and South Carolina, as well as North Carolina, and will conduct his operations from the company's Durham office.

On Jan. 25, Mr. Hussey announced that Walter M. Curtis Jr., also of Bluefield, has been selected as a plant extension engineer for General of the Southeast and will be located in Durham where he will report directly to Mr. L. D. Styron, general plant engineer.

And on Jan. 24, Mr. Hussey announced the appointment of Arnold Swallows, formerly of Cookeville, Tenn., as transmission engineer for General of the Southeast with headquarters in Durham. Mr. Swallows will report directly to Mr. Styron, and will be responsible for transmission engineering of General companies in the six-state southeastern area.

## OK Purchase in Minnesota

The Minnesota Railroad & Warehouse Commission on Jan. 28 authorized the Home Telephone Co., Clarkfield, to purchase the Boyd Telephone Co.

## Michigan Bell Announces Retirement; Appointments

Waldorf T. Kirk, general plant manager for the Michigan Bell Telephone Co., has been elected secretary of the company by its board of directors to succeed Lionel M. Chicoine who is retiring in February after more than a half century of service.

The appointment is effective Feb. 1. In a series of other moves, effective at the same time, William M. Day, president, announced the following other high-level changes:

John F. Agar, assistant general plant manager, to general plant manager, succeeding Mr. Kirk; Kenneth W. Thompson, assistant vice president-personnel, to assistant general plant manager to succeed Mr. Agar; James B. Kaler, assistant vice president-public relations, to succeed Mr. Thompson as assistant vice president in the personnel department; and James M. Freeman, news service manager for the American Telephone & Telegraph Co. at Washington, assistant vice president-public relations to succeed Mr. Kaler.

## 1957 Convention Calendar

| *Association* | *Date* | *City* | *Hotel* |
|---|---|---|---|
| Minnesota | Feb. 18, 19 and 20 | Minneapolis | Radisson |
| Louisiana | Feb. 27 and 28 | Shreveport | Captain Shreve |
| Kentucky | March 5 | Lexington | Phoenix |
| Southern Counties of Ontario | Mar. 19 | Chatham, Ontario | William Pitt |
| Texas | March 28 and 29 | San Antonio | Gunter |
| Iowa | April 2 and 3 | Des Moines | Fort Des Moines |
| Ohio | April 16 and 17 | Columbus | Deshler-Hilton |
| Nebraska | April 23 and 24 | Lincoln | Cornhusker |
| Indiana | May 8 and 9 | Indianapolis | Claypool |
| Wisconsin | May 15 and 16 | (City and hotel unannounced) | |
| Communications Section, Association of American Railroads | May 21, 22 and 23 | Toronto, Ontario, Canada | Royal York |
| Illinois | May 22 and 23 | Peoria | Pere Marquette |
| Kansas-Missouri* | May 27 and 28 | Kansas City | Town House |
| Pennsylvania | June 4 and 5 | Buck Hill Falls | Buck Hill Falls Inn |
| Maine-New Hampshire-Vermont* | June 4, 5 and 6 | Portsmouth, N. H. | Wentworth-by-the-Sea |
| California | June 5, 6 and 7 | Los Angeles | Ambassador |
| Washington-Oregon* | June 13, 14 and 15 | Spokane, Wash. | Davenport |
| New York | June 17, 18 and 19 | Schroon Lake | Scaroon Manor |
| Arkansas | Sept. 16 and 17 | Hot Springs | Arlington |
| Michigan | Sept. 17, 18 and 19 | Grand Rapids | Pantlind |
| Rocky Mountain | Sept. 19 and 20 | Salt Lake City, Utah | Utah |
| North Carolina | Oct. 3 and 4 | Pinehurst Carolina | |
| USITA (Annual convention) | Oct. 14, 15 and 16 | Chicago | Conrad Hilton |
| Virginia | Oct. 24 and 25 | Roanoke | Roanoke |
| Oklahoma | Nov. 21 and 22 | Oklahoma City | Huckins |

*Joint Conventions

Early Teletypewriter

Teletype Model 28 Printer

# 50 YEARS THAT CHANGED THE PICTURE

The need for a reliable printing telegraph instrument that would provide a typed record of the message for both sender and receiver brought the company now known as the Teletype Corporation into the picture in 1907. From the halting performace of the original page printer to the smooth 100 words per minute of today's precision equipment has been a major step in communications.

But today Teletype equipment is often far more than a communication instrument. It is a basic element in production control systems . . . its ability to transmit and reproduce text and punched tape is harnessed to office automation . . . it provides a "conveyor system" for channeling complex raw data to a computing center thousands of miles away—and getting the answers back in a twinkling.

Indeed, Teletype machines have made many of the dreams of 1907 a daily part of today's business world. And the horizons widen daily as new dreams occupy our engineers and keep our laboratories humming.

If you would like a copy of our booklet, "The ABC's of Teletype Equipment," write to Teletype Corporation, Dept. T-2, 4100 Fullerton Ave., Chicago 39, Illinois.

TELETYPE®

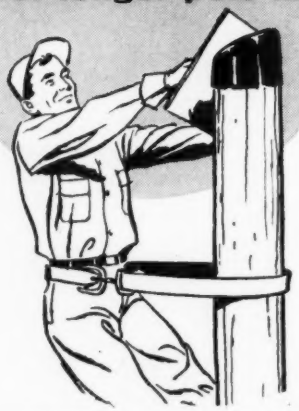
TELETYPE CORPORATION
SUBSIDIARY OF
Western Electric Company
INCORPORATED

*1957 Golden Anniversary Year*

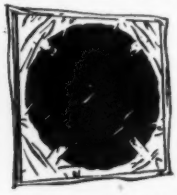
PROTECT

POLE TOPS

...for longer pole life!



Keep WATER and WEATHER from causing pole roof deterioration and your standing poles will REMAIN STANDING as much as 10 to 20 years longer. Fungus, wood fiber shrinkage and swelling, freezing and thawing are a thing of the past simply by having your own crews apply POLE TOPPERS. Every line truck might well have a supply on hand at all times and make the applications along with their regular line work.



**POLE TOPPERS**

*Actual size 15" dia.*

Those neat appearing, protective pole roof tops that are easy to handle — easy to apply. POLE TOPPERS contain 5% Penta.

Your own linemen can make an application in LESS THAN A MINUTE, once in position. Use POLE TOPPERS for all standing poles — for new poles or newly cut poles — for poles in the yard.

POLE TOPPERS . . . the most inexpensive and satisfactory preservative ever devised for successful, permanent use. The Price is but $1 each. Shipped in cartons of 1 Doz. weighing 13 pounds packed. Why not sample POLE TOPPERS and prove their value to your company?

*for complete details write to:*

OSMOSE

OSMOSE WOOD PRESERVING CO. OF AMERICA, INC.

974 ELLICOTT STREET BUFFALO 9, N. Y.

*Producers of a complete line of wood preservatives*

for: MINES • RAILROADS
UTILITIES • FARM and HOME


## California Independent Builds Telephone Center

Using an air hammer instead of the conventional shovel for the traditional ground-breaking ceremonies, J. W. Newman, president, Coachella Valley Telephone Co., recently inaugurated an accelerated expansion program that includes construction of a new $400,000 telephone center at Indio, Cal.

**J. C. Newman, manager, Coachella Valley Telephone Co. looks on with J. A. Rector of Automatic Electric Sales Corp. as J. W. Newman, president of the telephone company, uses an air hammer to break ground for a $400,000 telephone center at Indio, Cal. The new exchange building and installation of SATT direct distance dialing facilities, inward intertoll dialing, expanded central office equipment and new eight-position toll board, are scheduled for completion late this year.**

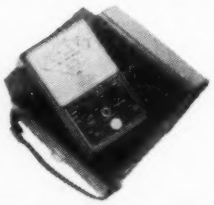
A new and enlarged $50,000 telephone building of modern design, comprising 5500 square feet, is being erected to house Type B SATT Direct Distance Dialing (DDD) facilities, inward intertoll dialing, expanded central office equipment and a new 8-position toll board.

When the total $400,000 project is completed late in 1957, including buildings and equipment installation, all telephone subscribers will be able to dial station-to-station long distance calls direct. The only assistance from an operator will be to record the calling party's number. Calls will be recorded, timed and priced automatically.

Over-all supervision of the project is under the direction of J. C. Newman, manager son of President Newman. "We have planned and engineered this program in such a way," he says, "that all switches and equipment previously in use, and now being replaced by new equipment, will be placed in service in other offices. Nothing previously pur-


New, Electronic Instruments from Fisher

Try famous Fisher instruments on a 10-day FREE TRIAL OFFER. Simply request it on your company's purchase order.



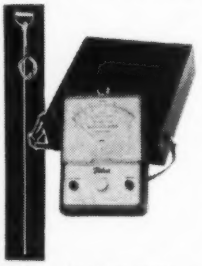
Portable Battery-Operated Vacuum Tube MILLIVOLTMETER

- Accurately measures small field potentials to 50 MICROvolts
- 8 full scale ranges from 0—25 millivolts
- Accuracy ± 1½% on ALL ranges
- 10 megohms input resistance AC or DC models

$225.00

Electronic Witch M-Scope PIPE & CABLE FINDER

This proven, advance instrument outperforms any cable finder on the market regardless of price or design $172.50



Transistorized SOIL RESISTIVITY METER

Gives on-the-spot measurements in ohm/cm³. New ALL ELECTRONIC circuit. Includes 4 ft. probe, leather case . . . weighs only 3¼ lbs. $165.00

Transistorized POTENTIOMETER VOLTMETER

- 8 full scale ranges from 100 millivolts
- Accuracy ± 2% on ALL ranges
- Truly portable—only 4¾ lbs. with leather case

$135.00

SEND FOR FREE CATALOG of 1957 Electronic Instruments by Fisher

*Geophysical Instruments Since 1932*

Fisher

RESEARCH LABORATORY, INC.
Dept. TY-1, Palo Alto, California

chased will become obsolete or scrapped."

Indio, the date capital of the United States, is located in the heart of the rolling desert of southern California. The company serves the agricultural lands and resorts of the fertile Coachella Valley, with some 7500 subscribers and exchanges at Indio, Coachella, Thermal, Palm Desert, Mecca, Oasis and Thousand Palms.

A wide variety of crops is produced on the Valley's irrigated lands, but grapes and dates accounted for about two-fifths of the area's crop evaluation of more than 25 million dollars in 1955.

## General of SE President Named to N. C. Bank Board

H. E. Hussey, chief executive officer for the General Telephone Co. of the Southeast, has been named a member of the board of Wachovia Bank & Trust Co. in Durham, N. C.

Wachovia is the largest bank in the Southeast in resources, in deposits and in capital and surplus.

Mr. Hussey is also president of Durham Telephone Co. and other affiliates of the General Telephone System in the Southeast. His headquarters are in Durham. He previously was president of the General Telephone Corp. of Indiana and vice president and chief engineer for General Telephone System in Michigan, Indiana and Kentucky. Prior to 1948 he was associated with General Telephone Co. of California.

## Southern Bell Announces New Executive Appointments

Three important executive appointments were announced recently by Southern Bell Telephone & Telegraph Co.

John M. Wasson, now South Carolina vice president and general manager, will become vice president and general manager—North Carolina. He will succeed Joe S. Stone, who recently was appointed operating vice president —east.

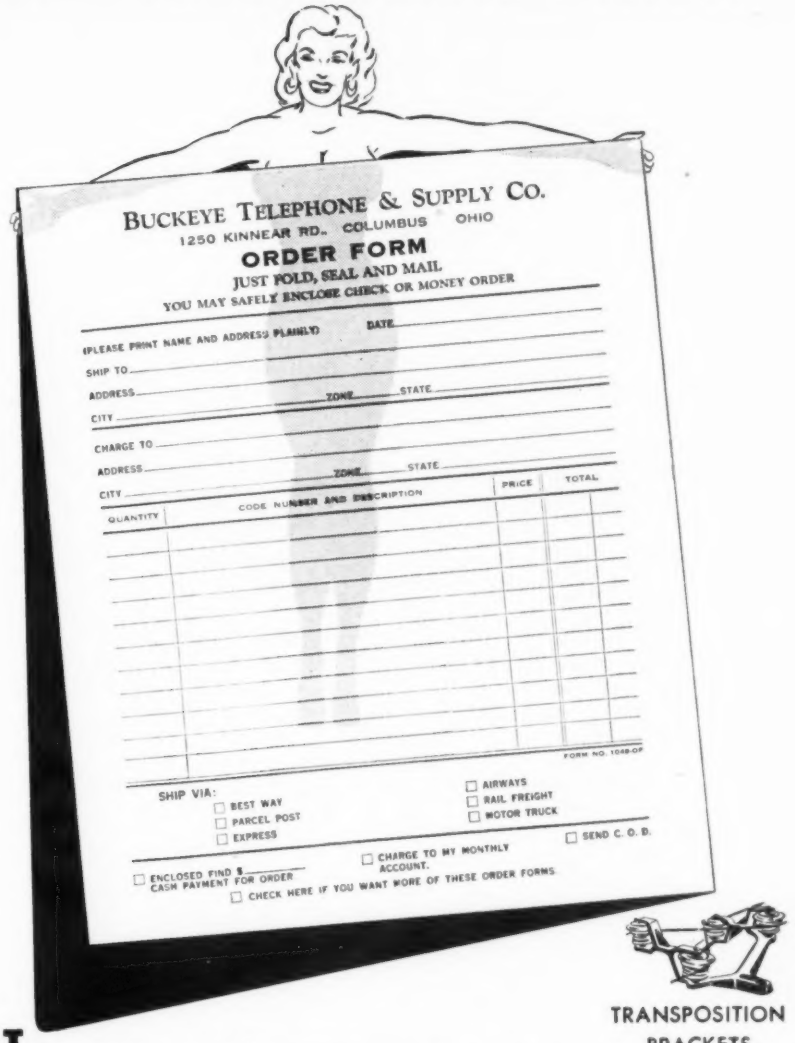
Walter G. Edwards, South Carolina commercial manager, is named to the position of South Carolina general manager, succeeding Mr. Wasson.

Frank Newton, of Atlanta, assistant vice president—operations in the company's general headquarters, assumes the position of Alabama general manager. He fills the post of William A. Thompson who recently was named vice president—personnel. The changes are effective immediately.

Each of the new appointees is qualified by wide experience to fill his new assignment.

Mr. Wasson has discharged impor-


# WHAT DOES AN ORDER FORM COVER?





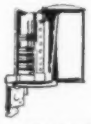

TRANSPOSITION BRACKETS

NICOPRESS TOOLS and SLEEVES

CABLE SPLICERS' EQUIPMENT

**HERE at Buckeye it covers everything vital to the telephone industry. Everything from pole line hardware to small tools and power equipment are stocked in our warehouse and they are all famous trademarked . . . Cook protective devices, Chance anchors, Klein tools and Nicopress tools . . . to mention a few.**

**Remember too: this order form covers the dependable efficient service for which Buckeye is known. Every order, regardless of size, receives the same careful consideration and no matter how varied the items may be, you can rely on Buckeye as the centralized supply source to answer your every demand.**



CABLE TERMINALS

MOTOR GENERATOR SETS

INDOOR and OUTDOOR CABLE

POWER SUPPLY

CABLE SPINNING EQUIPMENT

***Whatever Your Needs . . . Write or Call***

## BUCKEYE TELEPHONE & SUPPLY CO.

**Dept. "T", 1250 KINNEAR RD., COLUMBUS 21, OHIO**

tant telephone responsibilities in North Carolina, South Carolina, Georgia and Tennessee in his 32 years of telephone service. He was appointed South Carolina plant superintendent in 1949, North Carolina plant superintendent in 1950, and in 1954 was transferred to Atlanta as plant operations engineer. In May, 1955, he moved to Columbia to head the company's operations in South Carolina.

Mr. Edwards joined Southern Bell in 1926 and has served in a wide variety of supervisory positions in North Carolina and South Carolina. In 1935, he was appointed Carolinas division commercial supervisor with headquarters in Charlotte, and later returned to Columbia, S. C., as manager. He was appointed Columbia district manager in 1945 and was advanced to South Carolina commercial manager in 1953.

Mr. Newton's early telephone experience, dating from 1925, was gained in Georgia. In 1937, he was appointed district traffic manager in Shreveport, La., and in 1940 was transferred to Macon, Ga., in the same capacity. Later he served as Georgia traffic supervisor, Miami district traffic manager and Florida plant supervisor. After working in other key management positions, he was appointed general traffic manager in 1953 and assistant vice president in 1954.

## Head of Virginia Company Named Outstanding Citizen

The Richmond County Ruritan Club on Jan. 22 presented the Outstanding Citizen Award for 1956 to Rodney M. Coggin, president of the Tidewater Telephone Co., Warsaw, Va.

This award is presented annually by the club to the person selected by a committee of representatives from each of the civic organizations in the county.

T. D. Marks, who presented the engraved plaque in behalf of the club, pointed out that the selection was made, not only on the basis of Mr. Coggin's achievements in 1956, but with consideration given to the cumulative contributions to the progress and development of Warsaw, Richmond County and the area, during his approximately 40 years as a citizen of the area known as the Northern Neck.

## Aim of Government

"The end of government is the good of mankind."—JOHN LOCKE.

## Report Hawaii and Alaska Do Most Telephone Talking

The two most talkative telephone spots on the globe are U. S. territories —Hawaii and Alaska.

This and other facts were reported in "The World's Telephones," the American Telephone & Telegraph Co.'s annual survey.

At the beginning of 1956, the survey showed, there were 101 million telephones in the world, or two telephones for every one in service 10 years earlier. The total reflected a record increase of 6½ million over the previous year.

When it came to using the telephone, Hawaii out-talked all other areas. The island territory reported 647 conversations per capita during 1955. Alaska was second with 572.

For the fourth successive year Canada averaged more telephone conversations per person (446) than did the United States, which had 409. Iceland, as usual, ranked high on the conversation list with 399.

Each of these was among the 11 countries or areas reporting 15 or more telephones for every 100 inhabitants. The United States headed this list with


LOOK TO THE LEADER...

for

- RELIABILITY
- SERVICE
- NATIONALLY KNOWN TELEPHONE SUPPLIES

Prompt delivery of your order as specified is assured by Lindsay's fast, efficient, personalized service. Lindsay specializes in telephone supplies *only* . . . warehousing a complete line of the finest nationally known brands . . . your guarantee of the best as you want it . . . when you want it.

LOOK TO LINDSAY

THE LINDSAY TELEPHONE SUPPLY CO., Est. 1939

10409 Meech Ave., Cleveland 5, Ohio • Telephone Diamond 1-9212

33.7 telephones per 100 population, or about one telephone for every three persons. Sweden, which for many years has been second only to the United States, was next with 30.4 per 100 population. Hawaii ranked third with 29, and Canada was fourth with 26.3. Iceland was tenth with 17.1. Alaska was eleventh with 16.8.

These figures are for the year 1955—it takes almost a year to gather the information from some 250 governments and companies throughout the world.

Telephones in Spain reached the million mark during 1955. Statistics of the Democratic Republic of Germany (East Germany) show that that country, too, had more than a million telephones. These two additions bring the number of countries reporting more than a million telephones to 14: United States, United Kingdom, Canada, West Germany, Japan, France, Italy, Sweden, Australia, Switzerland, Argentina, the Netherlands, Spain and East Germany, in that order.

In the United States as of Jan. 1, 1956, there were 56,243,000 telephones (now there are more than 59 million) operated by some 4,700 private companies. Most of the telephones in European countries were operated by government agencies.

A person in the United States could pick up a telephone and call any of 97 million other telephones—41 million of them located in more than 100 other countries or territories.

### Answers to Questions On Page 38

(1) Yes.

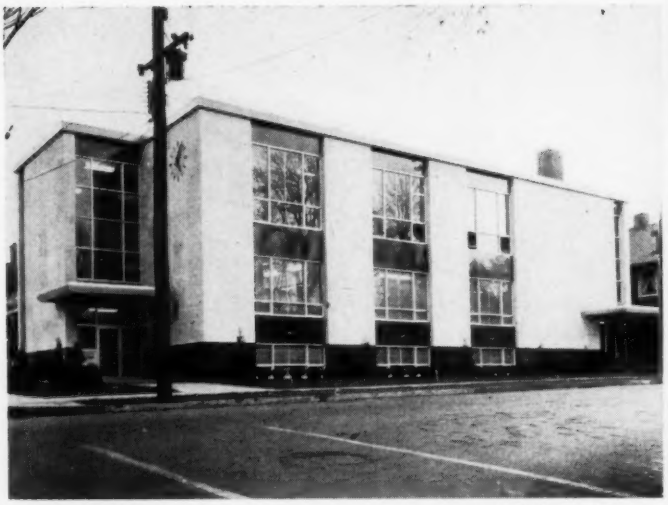
(2) The Toll Auxiliary Operator will say, "LK ticket," and when the operator says she will call again later, the Toll Auxiliary Operator will say "Right," release the line, and refer the case to the service assistant or supervisor.

(3) She will hold the ticket waiting for a call from the distant operator.

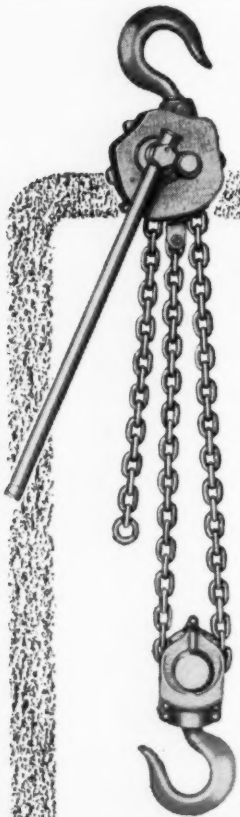
(4) She will secure and enter his name on the ticket, if necessary, and say "I will have the service assistant (or 'supervisor') investigate and call you." She will refer the case to the service assistant or supervisor, giving the details of the call, including the number of minutes, class of call, information quoted, and the substance of the customer's claim.

(5) The ticket will be disposed of as directed.

ALPHADUCT
TELEPHONE WIRE
1000
here's a drop wire that
lasts longer
costs less
ALPHADUCT DUMBBELL PARALLEL
DROP WIRE WITH NEOPRENE JACKET, No. 18 COPPERWELD CONDUCTORS
Now you can have the longest lasting, neatest drops you've ever strung . . . and at less cost too.
Alphaduct's dumbbell or figure eight construction provides the best protection for the conductors, and is the easiest to install of all the neoprene jacketed drop wires. The No. 18 Copperweld is 20% stronger than No. 17 bronze.
Alphaduct's tough neoprene jacket protects the insulation against sunlight, moisture, oil, acids, abrasion, etc. Each conductor has the same thickness of rubber insulation and neoprene jacketing as it does in twisted pair construction. The dumbbell shape permits splitting the wire without damage to insulation or neoprene jacket on either conductor.
Try this remarkable Alphaduct dumbbell drop wire. It's step-tested during manufacture, dated, so you can tell how long it lasts and carton packaged for your convenience and protection. Order today from the distributors listed below.
IT'S DATED • FOR YOUR CONVENIENCE AND PROTECTION
ALPHADUCT WIRE AND CABLE COMPANY
CHarter 9-8090 P.O. BOX 709, NEW BRUNSWICK, NEW JERSEY
NATIONAL DISTRIBUTORS—AUTOMATIC ELECTRIC SALES CORP., CHICAGO, ILL.
LEICH SALES CORPORATION, CHICAGO, ILL.
REGIONAL DISTRIBUTORS—THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO
PANKEY SUPPLY COMPANY, CHARLOTTESVILLE, VA.



**LEFT PHOTO (above): New central office building for Ohio Telephone Service Co.'s Greenville, O. exchange, which houses automatic equipment manufactured by Stromberg-Carlson Co. Following the cut-over, the company sponsored a two-day open house. RIGHT (above): At the conversion celebration dinner were (seated at table and reading clockwise from left foreground): E. R. Hetzler and R. E. Daniel, both of Ohio Telephone Service Co.; W. J. Pfaender of Stromberg-Carlson Co.; Dick Stoops and Robert Murchie, both of Ohio Telephone Service Co.; Lamar Stoops of Nappanee (Ind.) Telephone Co.; R. S. Shoemaker of United Telephone Co. of Indiana; J. E. Pequignot of Ohio Telephone Service Co.; Harold Snider, president, Greenville (O.) Chamber of Commerce, and Roy Haase, United Telephone Co. of Indiana. In the background (faces visible), left to right: Claude Warren, Indianapolis attorney; Cecil Burris and T. A. Danielson, both of Ohio Telephone Service Co., and P. J. Lucier of Stromberg-Carlson Co. RIGHT (below): R. F. Lucier, president and general manager of Ohio Telephone Service Co., and Gustav Hirsch, president of Gustav Hirsch Organization, Inc., are shown attending a special luncheon in celebration of the conversion to automatic at Greenville.**



*The most efficient, lightest, safest hoist in its capacity class available!*

**Coffing Super Power**

The Coffing Super Power coil chain hoist is more efficient (85%), more compact, has the greatest power-to-weight ratio and the highest safety factor (5) of any ratchet lever hoist available. This is possible because of Coffing's exclusive design which uses patented, compound hardened alloy steel levers instead of bulky, heavy gears.

An extra feature is the "safety valve handle" which bends at point of maximum safe overload—may be adjusted for length and operated from either side. It can't spin out of control.

Super Power hoists are available in 6 models from 1½ to 5 ton capacities. For greater hoisting efficiency and safety, ask your recognized distributor for Coffing Super Power hoists. For information, write Coffing Hoist Division, Duff-Norton Co., 808 Walter Street, Danville, Ill. Ask for Bulletin SP.

**COFFING HOIST**

DIVISION OF **DUFF-NORTON COMPANY**


## Billion Dollars to Speed Office Techniques Seen

During the next three years U. S. business will spend a minimum of one billion to modernize office procedures to keep pace with our fast-growing economy, in the opinion of one electronics official, Walter W. Finke, president of Datamatic Corp.

Mr. Finke, in a year-end forecast, estimated that there are currently at least 1,000 firms—industrial, business, financial, service and government agencies—that are "losing money every day they struggle to stem the mountainous tide of paperwork with obsolete equipment and clerical, billing and bookkeeping procedures that are fast becoming outdated." With a 500-billion-dollar economy predicted for 1960, Finke said,

# PAGE
## LASHING WIRE

You get a neat and long-lasting job every time you use PAGE Stainless Steel Lashing Wire! Ideal for lashing conductor cables (lead or neoprene covered) to a strand messenger by Neale or Western Electric Machine. Coils tailored to fit machine specified.

**3 GRADES · EACH IN 2 SIZES (.065 and .045)**

**Type 430 · for use with galvanized messengers**
**Type 302 · for use with stainless messengers**
**Type 316 · for use under severe corrosion conditions**

Furnished six coils in cardboard carton (minimum order).

**Other fine-quality products** · You can depend upon PAGE Strand (Stainless or Galvanized Steel) and PAGE Stainless Dead-End Wire · See your Telephone Supply Distributor, or write our Monessen, Pa., office.

**Page Steel and Wire Division**
**AMERICAN CHAIN & CABLE**

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

---

**BEST TRANSMISSION VF/CARRIER**

# COPPERWELD LINE WIRE

**NEW — Gov't Surplus**

**250,000 lbs. — Save 25%**

**#12 AWG (.080) 40% Conductivity**

**High Strength — Original Coils (100 lbs. Ea.)**

**Export Wrapped (100%) 40c lb.**

**Domestic Wrapped (Slight Tarnish) 35c lb.**

**Sample on Request**

**Delivery Guaranteed Per Sample**

**Freight Allowed 10 Ton Minimum**

## BUCHMAN MATERIALS CO.

**725 SO. WESTLAKE AVE., LOS ANGELES, CALIF.**

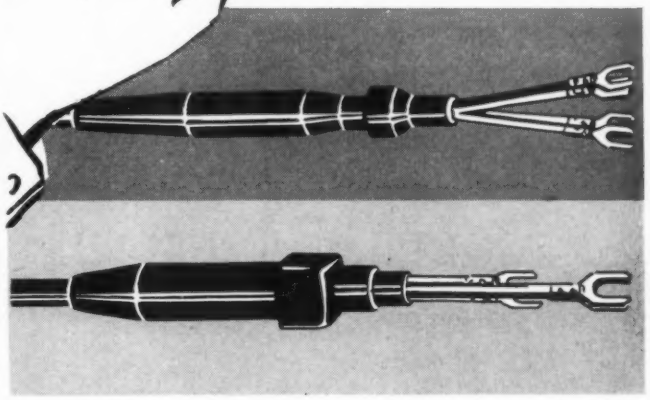
**PHONE DU-3-1381**

---

a good installation calls for a good cord

# COMMERCIAL
## TELEPHONE CORDS

are made better to last longer



No matter what the installation may be, there's a Commercial Cord to fit it . . . made from the best materials obtainable, to guarantee lasting durability and efficient voice transmission. Select them in the jacket that best suits your requirements:

- **NYLON**
- **NEOPRENE**
- **MERCERIZED COTTON**

- **switchboard cords with or without plugs;**
- **instrument cords; operator's cords;**
- **retractable handset cords (Neoprene only)**

*Write for a complete catalog, samples and prices.*

## COMMERCIAL CORD
**& SUPPLY CO., INC.**

CLIFTON SPRINGS, N. Y.

*Phone: Howard 2-5111*

QUALITY CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

there is no prospect of a diminishing of this paperwork load.

In his forecast Finke indicated that this business climate would stimulate sales of electronic computer systems—generally regarded as one practical answer to these problems. He estimates that the one billion dollars to be invested in office automation before 1960 actually represents about 50 per cent of the current market for large-scale (1.5 billion to 2 billion dollars) general-purpose electronic data-processing systems.

"Many companies whose operations are on a scale that makes it possible for them to profit from this great advance are spending sums that range from $200,000 to $750,000 just to study the feasibility of using these giant 'brains,'" Finke said.

Some idea of the magnitude of the job involved in the application of one of these systems can be gained from the fact that the initial studies generally take a year or more. They are followed with two years of training and programing.

"The computer industry is investing nearly 4 million dollars in customer training alone, to facilitate this evolutionary change-over to electronics," Finke pointed out.

He explained that his own firm (jointly owned by Minneapolis-Honeywell and Raytheon) during 1956 sold four giant "brains" on a rental basis, at prices equivalent to 1¾ million dollars to more than 2 million dollars. Datamatic is investing an average of $200,000 on customer training to prepare its customers for the machines and vice versa, he said.

Another force aiding prospects for computer industry growth, Finke said, is the inevitable—and predictable—labor shortage that's on the horizon. He explained that the biggest increases in our population are in the under-18 and over-65 brackets. The number of workers between those age brackets is not rising in proportion with a population now at more than 168 million and expected to hit 213 million by 1975.

"To prosper and expand and to maintain our rising standard of living in face of the mushrooming population (11,500 were born daily in 1956) business is going to have to be more productive. Automation, in the office as well as the factory, will be a necessary part of the scheme of things tomorrow to accomplish this," Finke said.

## Baby Owes $1,939

"The tax bite on earnings is only the annual story of what government seems to be costing," writes Sam M. Jones in *National Review*. "Behind it lies a debt so large today that every baby is born owing the government $1,939 before he lets out his first howl. If he is a member of a family of four, his papa will represent a government debt of $7,738."

## Motorola Names Byrne Microwave Sales Manager

Leonard G. Walker, marketing manager, Motorola Microwave Industrial Control Department, has announced the promotion of Walter C. Byrne Jr. to the position of sales manager for these products. Mr. Byrne will be

W. C. BYRNE

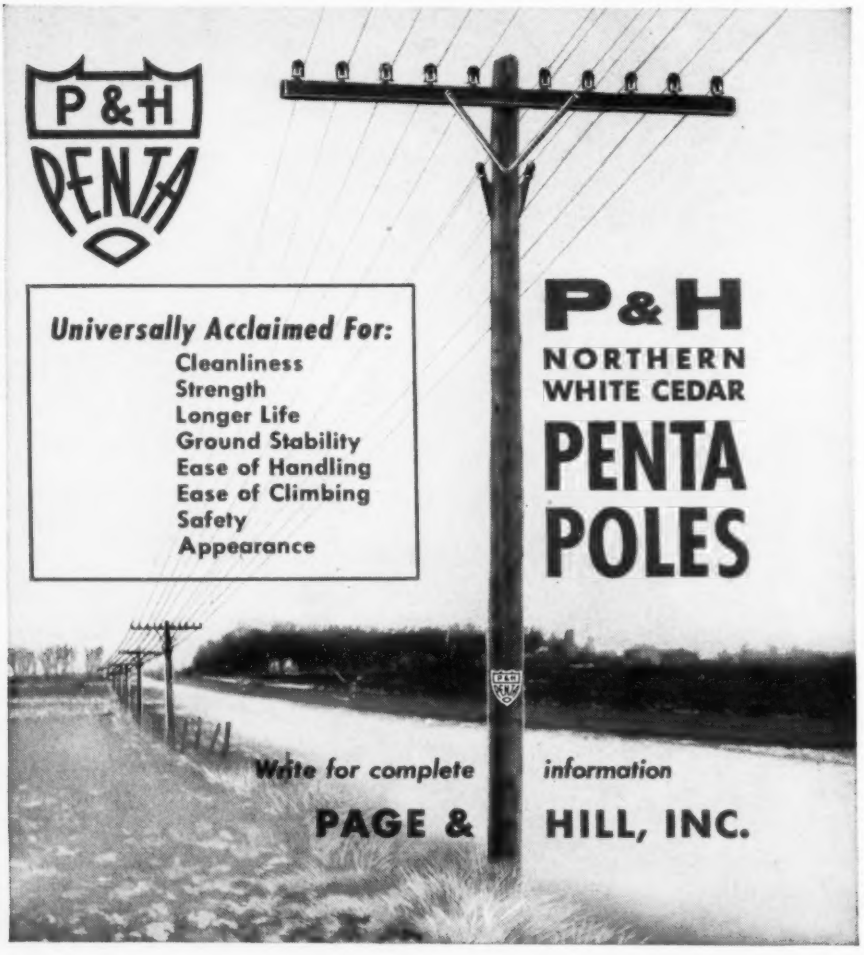
responsible for the nationwide direct sale of Motorola microwave, power line carrier, audio multiplexing, power transmission line carrier couplers, and industrial control equipment.

Prior to his new assignment, Mr. Byrne was midwestern district sales manager.

With Motorola since 1950 Mr. Byrne was first a senior engineer and then a specialist in microwave and industrial control products. He holds both electrical and mechanical engineering degrees from Tulane University, and for several years before joining Motorola was a research engineer in the Nuclear Physics Laboratory at Tulane.

During World War II, he was a naval officer assigned to destroyer duty. An active radio amateur, Mr. Byrne constructed and demonstrated the first amateur television camera, transmitter and receiver in the South.

He is a member of the Institute of Radio Engineers, American Institute of Electrical Engineers, and the Louisiana Engineering Society.

## FWD Auto Co. Names Pernot Sales Engineering Director

Lloyd L. Pernot, transport sales manager since 1951, has been promoted to director of sales engineering by the Four Wheel Drive Auto Co., Clintonville, Wis. manufacturer of custom-designed four and six-wheel-drive trucks.

L. L. PERNOT

G. F. DeCoursin, vice president-sales who announced the appointment, said Mr. Pernot in his new capacity will supervise all FWD market specialists and the sales correspondence section. He also will continue to be responsible for transport market product development.

Pernot entered the FWD organization Dec. 15, 1932, in the machine shop and shortly after entered the service repair department. He became service manager in 1938 and held that position until being made transport sales manager in 1951. Under a new FWD sales setup, transport sales representatives henceforth will be supervised by assistant sales managers of eastern and western divisions.

## The Greatest Danger

"The prescriptions in favor of liberty ought to be leveled against that quarter where the greatest danger lies, namely, that which possesses the highest prerogative of power. But this is not found in either the Executive or Legislative Department of the Government, but in the body of the people, operating by the majority against the minority. But I confess that I do conceive that in a Government modified like this of the United States, the great danger lies rather in the abuse of the community, than in the legislative body." — JAMES MADISON, (discussing the Bill of Rights before the First Congress)


Here's a telephone battery that:

*lasts at least 40% longer!*

*requires 80% less current and water!*

*delivers high output all its life!*

**C&D's PlastiCal®** is the most outstanding floating-service battery of the last 50 years. Here's a basically new battery that combines a durable, clear-plastic case with lead-calcium* grids. This new alloy of pure lead and calcium gives grids the strength of those with a large antimony content, but eliminates the harmful effects of antimony.

**C&D's PlastiCal has these advantages:**

1. *a 40% longer life* than any lead-antimonial battery in floating-service. There is no antimony in the PlastiCal to poison negative plates.
2. *requires 80% less current* to maintain itself in a fully charged condition. Lower charging rate means plates last longer.
3. *requires 80% less water.* Because PlastiCal uses less current, there is less electrolysis of water.
4. *low maintenance cost.* PlastiCal can be checked at a glance because the electrolyte level is always visible.
5. *delivers high output throughout its life.* Rated capacity remains steady because negative plates do not become contaminated.

**A development of Bell Telephone Laboratories*

C&D

BATTERIES, INC.

of Conshohocken, Pa.

Industrial Batteries Since 1906

GET the latest!

For complete information and specifications on PlastiCal—the century's greatest battery development—write for folder T-528 Rev. 3.

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

## York-Hoover Corp. Offers New Auxiliary Winch Drive

Donald H. Groft, chief sales engineer, York-Hoover Corp., York, Pa., has developed a new auxiliary hydraulic winch drive that provides remote control and better control of winch on line construction public utility trucks. This new drive gets the oper-

D. H. GROFT

ator out of the truck cab, and through this auxiliary hydraulic winch drive he can operate the derrick from the rear end of the truck in 90 per cent of operations, the company states.

This arrangement is provided to increase operating efficiency by enabling a craftsman to operate a winch line from the same location as the exterior hydraulic derrick and digger controls. This new drive can be used by electric utility, telephone and construction companies, and outdoor advertising firms.

Mr. Groft became associated with the York-Hoover Corp. in 1945. During World War II he was associated with the Chrysler Corp. in Chicago, building engines for B-29 aircraft. He is a member of the Society of Automotive Engineers.

## C & D Batteries, Inc. Adds Atlanta Sales Engineer

Mark C. Pope Associates, Atlanta sales representatives for C & D Batteries, have added Eugene L. Krauss to the staff. Mr. Krauss joins C & D following eight years' service with the storage battery division of Thomas A. Edison, Inc. He was a district manager for Edison.

A graduate of George Washington University, District of Columbia, Mr. Krauss had had a number of years' experience in the electrical field with District Electric Co., Washington, D. C.; Potomac Electric Power Co., and BullDog Electric Products Co.

E. L. KRAUSS

Still active as a lieutenant commander in the Naval Reserve, Mr. Krauss also holds a membership in the Illuminating Engineering Society.

## Krueger Heads Duff-Norton Jack Division Sales

Duff-Norton Co. recently announced the promotion of T. W. Krueger to sales manager of the jack division. He will be in charge of all industrial, railroad and export jack sales.

Mr. Krueger moves up from a position as assistant sales manager of Duff-Norton, one of the nation's largest manufacturers of jacks. He joined the company in 1947 as advertising and sales promotion manager.

Mr. Krueger previously was in the advertising and public relations department at Jones & Laughlin Steel Corp.

## Gould Names Manager Of Field Engineering

R. W. Hopewell has been named manager of field engineering for the industrial division of Gould-National Batteries, Trenton, N. J.

In his position, Mr. Hopewell, who previously served as manager of field service for Gould, will be available on new installations for evaluating battery and charging equipment requirements as well as for establishing good maintenance procedures. On established installations his department will survey present practices and recommend improved operating maintenance methods.

Hopewell has spent nine years in Gould's extensive laboratory operations, four years in field service and two years in sales. He will now direct the Gould customer service program which maintains service stations and facilities in all principal cities of the United States.

## Cook Research Names Beck Executive Engineer

Elmer A. Beck Jr. has been promoted to the position of executive engineer by Cook Research Laboratories, a division of Cook Electric Co., Chicago, it was announced on Jan. 26 by J. Robert Downing, director of the division.

Mr. Beck has been with Cook Research Laboratories since 1952 as a mechanical research and development engineer. In his new position, he will be a group leader of the systems development section.

## Economic, Personal Freedom

"We must not let the glib talkers inside and outside our country delude us with promises of an easy world where decisions are made for us—and slaves are made of us. We must have economic freedom if we will have personal freedom. We cannot give up a portion of our liberty and save our freedom."—REESE H. TAYLOR, *chairman of the board, Union Oil Co. of California.*

## Inspiring Science Careers

"At this moment when the free world needs trained engineers and other technicians so acutely, it is worth recognizing that you cannot force youngsters into science, but you can help to inspire them. . . ."—MAJ. LENOX R. LOHR, *president, Chicago Museum of Science & Industry.*


**McGRATH ENGINEERS, INC.**
*Consulting Engineers*
209 West 6th Street
TOPEKA, KANSAS
Telephone 2-2358

**CARL C. CRANE, INC.**
*Consulting Engineers*
2702 Monroe Street, Madison 5, Wis.
Telephone CEDAR 3-4210

**CABANISS-POGUE COMPANY**
*Consulting Engineers*
Appraisals—Cost and Rate Studies
Financial Assistance
GRANT BLDG., ATLANTA, GEORGIA

**McGRATH ENGINEERING, INC.**
*Consulting Engineers*
209 West 6th Street
TOPEKA, KANSAS
Telephone 2-2358

**T. A. HEYWOOD**
**Telephone Services**
Engineering Pole Line Construction Cable Splicing Operations Installations Maintenance
*Specializing in R.T.A. Engineering*
Box 197
Goshen, Ohio Phone REgent 4-4741

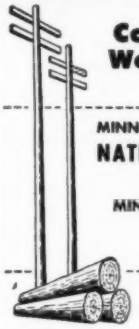
**INSPECTION SERVICE**
Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Consulting and specification writing. Inspectors stationed throughout U.S.A.
**A. W. WILLIAMS INSPECTION CO., INC.**
MOBILE, ALABAMA
ESTABLISHED 1921—MEMBER A.C.I.L.

**SLOAN, COOK & LOWE**
CONSULTING ENGINEERS
Appraisals—Original Cost Studies
Plant, Traffic and Commercial Engineering
120 S. La Salle St.
Chicago 3, Ill. Tel.: FRanklin 2-5924

**TELEPHONE PRINTING**
By People Who Know the Telephone Business
SEE THE SUTTLE CATALOG
**SUTTLE EQUIPMENT CO.**
LAWRENCEVILLE ILLINOIS

**POLES**
CREOSOTED SOUTHERN YELLOW PINE
LOW *RESIDUE* COAL TAR DISTILLATE
*"Truck Delivery Our Specialty"*
**THE BAKER WOOD PRESERVING COMPANY**
P.O. BOX 355 MARION, OHIO

**DAVIS**
CONSTRUCTION COMPANY
UTILITY PLANT CONSTRUCTION
45 North Clark Street • Sullivan, Missouri

**NORTHERN WHITE CEDAR**

**Coast Douglas Fir**
**Western Red Cedar**
*Plants and Yards:*
MINNEAPOLIS, MINN. • SPOKANE, WASH.
**NATIONAL POLE and TREATING DIVISION**
MINNESOTA AND ONTARIO PAPER COMPANY
Minneapolis 2, Minnesota
*Branch Offices:*
CHICAGO • SPOKANE

**ATLANTIC**
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles • Crossarms
PLANTS AND OFFICES
Boston, Mass. Portsmouth, Va.
New York, N. Y. Philadelphia, Pa.
Savannah, Ga.

**L. D. McFARLAND COMPANY**
Box 390 • Sandpoint, Idaho
WESTERN RED CEDAR, DOUGLAS FIR, WESTERN LARCH AND LODGEPOLE PINE. CREOSOTE AND PENTA BUTT OR FULL-LENGTH TREATED POLES.

*POLES*

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co.—Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Dierks Forests, Inc. (formerly Dierks Lumber & Coal Co.) Wood Preserving Division, 810 Whittington Ave., Hot Springs, Arkansas. Southern Pine select poles, all sizes and lengths, creosote and penta-pressure treated. Prompt shipment.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Long Bell Division, 926 Grand Ave., Kansas City, Mo. —Pressure-treated Southern Pine and Douglas Fir Poles. Creosote and Penta preservatives.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

**FOR SALE**
6—2½ Ton GMC 6x6 Trucks w/Hard Cab and Chassis
New Cable Reel Trailers with or without Electric Brakes.
6—Dodge Line Trucks w/Winch, Boom, 5 Man Cab, Reconditioned.
$2,150.00
MISCELLANEOUS—Ladder Trucks, Installer Trucks, Trenchers, Lineman's Tools, Used and Reconditioned Earth Boring Machines, and Pike Poles.
**WYOMING VALLEY EQUIPMENT DIV.**
714 WYOMING AVENUE
KINGSTON, PA. PHONE BU-7-3158

FOR ALL OF YOUR CENTRAL OFFICE AND PBX INSTALLATIONS, MODIFICATIONS, AND ENLARGEMENTS, IT'S THE
TELEPHONE ELECTRONICS INSTALLATION CORPORATION
BOX 858—ERIE, PENNA.—TEL #9-2198
*CAN WE BE OF SERVICE TO YOU?*

Construction Crews Station Installers
Central Office Installations
Cable Splicers Complete Engineering
**HENKELS & McCOY**
6100 North 20th Street Philadelphia, Pa.
Now Operating in 30 States

**CABLE SPLICERS • LINEMEN**
**STATION INSTALLERS**
STEADY WORK, GOOD PAY
MIDWEST LOCATION.
**The Weikel Line Company, Inc.**
FORT WAYNE, IND.

**ROBERT E. FOLEY CONSTRUCTION CORP.**
DESIGN—SURVEYS—APPRAISALS—Construction and Maintenance of Overhead and Underground Telephone Plant. Complete supply of poles available for emergency requirements.
48 GRISWOLD STREET
BINGHAMTON, N. Y. TEL. 2-7218

**TUDOR AND YAGER, INC.**
*Telephone Construction*
TIPTON, INDIANA
PHONE 125

**YATES CONSTRUCTION CO.**
*"Specializing in Telephone Construction"*
Cable Splicers, Telephone Installers, Equipment Installers, Construction crews.
1507 SOUTH SIXTH ST. PADUCAH, KY.
TELEPHONE 2-4623

**NEALE**
**CONSTRUCTION CO.**
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS PHONE 4-2621

# CLASSIFIED SECTION

**Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less. Classified advertisements must reach us 8 days before publication date.**

## HELP WANTED

WANTED: Telephone Installers, Cable Splicers, Linemen, Central Office Installers. Yates Construction Company, 1507 South 6th St., Paducah, Kentucky. Telephone 2-4623.

CENTRAL OFFICE INSTALLATION and/or maintenance. Ten years experience manual and automatic. Thoroughly experienced all phases of Step-by-Step. Prefer southeast location. Write Box No. 3929, c/o TELEPHONY.

PLANT ENGINEERS for large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, N. Y.

MANAGER for a rural telephone system located in southwest Texas. Must have administrative ability to achieve and maintain efficient operations and develop sound expansion programs. Ability to employ, train and direct personnel in all phases of telephone operations. Technical, plant and commercial knowledge and experience desired. Permanent position with opportunity for advancement. Replies confidential. Send written application giving your qualifications to Box No. 3932, c/o TELEPHONY.

## HELP WANTED

CABLE SPLICERS, Station Installers. Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

SWITCHMEN, LINEMEN, INSTALLERS-REPAIRMEN AND CABLE SPLICERS. Experienced switchmen, linemen, installers-repairmen and cable splicers for various areas in Ohio served by Ohio Consolidated Telephone Co. Please state experience in replies. Write Ohio Consolidated Telephone Co., P.O. Box No. 70, Marion, Ohio.

REVENUE ACCOUNTING SUPERVISOR for Class A telephone company operating 16 exchanges in northern Illinois. Salary commensurate with experience and ability. Ample opportunity for advancement. Employee pension and benefit plans in effect. Address reply to Northwestern Telephone Co., 304 West Main St., Freeport, Ill.

EQUIPMENT INSTALLER, experienced man with individual initiative wanted by progressive Class A telephone company in Northern California. Variety of interesting assignments in carrier, microwave, radio and central office equipment installations. Excellent pay and working conditions. Reply first letter directly to Chief Engineer, Citizens Utilities Company of California, Box 1789, Redding, Calif.

## POSITION WANTED

PLANT ENGINEER, 25 years with telephone industry, 15 years in Latin America, radio and carrier experience, now employed, desires to relocate. Write Box No. 3930, c/o TELEPHONY.

INSTALLER-REPAIRMAN, 16 years experience, desires change. Prefer position as local manager in charge group of small exchanges or exchange. Consider any offer or location. Write Box No. 3933, c/o TELEPHONY

MANAGER OR SUPERVISOR, 37, married, presently managing New Rea System converting to dial, desires to relocate in California or Northwest. Sixteen years experience in plant, field engineering, traffic and commercial. Bell System and Signal Corp. background included. Available in two months. Write Box No. 3931, c/o TELEPHONY.

## WANTED TO BUY

CANDLESTICK TELEPHONES—50c each; wall Magneto sets—$1.00, other materials. Write Steve Kwisty, Simpson, Penn.

MAGNETO TELEPHONE EXCHANGE, 250 to 350 stations, summer possession. Write Box No. 3934, c/o TELEPHONY.

TELEPHONES—all types—any condition. Write stating quantities and types. Our truck will pick up within 300 mile radius of Scranton, Penna. Write Box No. 3765, c/o TELEPHONY.

**WANTED TO BUY**

**USED CAX DIAL SWITCHBOARDS, TELEPHONES AND MISCELLANEOUS CDO EQUIPMENT**

**TELEPHONE EQUIPMENT, INC.**
**MONTROSE, MICHIGAN**
**TELEPHONE 2211**

**WANTED TO BUY**

**TELEPHONE OPERATING COMPANY**

**Write: Box No. 3856, c/o TELEPHONY**

## FOR SALE

WILL TRADE FOR TELEPHONE EXCHANGE SKATING ARENA. Fully equipped, excellent condition, finest maple floor, living quarters, land and building. Used for skating, dances, parties, etc. What have you? Write Box 463, Saint Jo, Tex.

**SWITCHES FOR WESTERN ELECTRIC No. 740-A DIAL PABX SWITCHBOARD**

**13 Line Finder Switches per W.E. Drawing No. ED-66124-32G4.**

**13 Selector-Connector Switches per W.E. Drawing No. ED-66142-32G9.**

**9 Combination C.O. Trunks per W.E. Drawing No. D-66274-32G10.**

**These switches are practically new and in excellent condition. They would be ideal for expansion or replacement on your present equipment.**

***Whatever Your Needs . . . It Pays to Call BUTELCO First!***

**BUCKEYE TELEPHONE & SUPPLY CO.**

**Address Dept. "T"**

**1250 KINNEAR RD. HU 8-0655 COLUMBUS 21, OHIO**

## FOR SALE

WESTERN ELECTRIC NO. 392 LOUD BELLS. Refinished and tested, with condenser—$6.00 each. Telephone Equipment, Inc., Montrose, Mich. Telephone 2211.

PAPER-LEAD TELEPHONE CABLES—1500 feet 202 pairs 22 gauge. Available in Charleston, S. C., for immediate shipment. Made to American specifications by largest West German cable manufacturer supplying many American Independents. Telephone or write: Columbia Technical Corporation, 61-02 31st Avenue, Woodside 77, N. Y. Telephone: AStoria 8-7401.

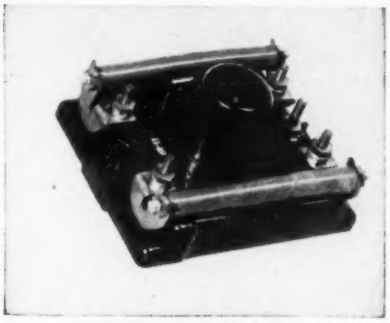
STROMBERG-CARLSON X-Y DIAL EQUIPMENT installed new 1953, available fourth quarter 1957. Wired for 200 lines equipped for 120 lines TPL with 20 cycle ringing. Also available 800 Stromberg-Carlson standard telephones to work with above equipment. Write Lewisberry Telephone Co., Lewisberry, York County, Pa.

THREE POSITION MULTIPLE BOARD (Kellogg Masterbuilt 6-800), CB 10-party selective ringing, relay racks, power equipment, main frame complete, converting to Dial March. Will sell very reasonable. Also North Electric all relay CX 30-line extension equipped for decimonic ringing, in cabinet, four years old, like new. Write Seminole Telephone Co., Donalsonville, Ga.

National Accounting Machine No. 31 Multiple Duty purchased new in 1953. Excellent condition. Used approximately three years for issuing payroll and maintenance of withholding records only. It can also be used for wage computation, cash distribution, accounts payable, budgetary control, comparative reports, sale statistics and other accounting jobs. Telephone or write: Central Telephone Co., 616 First Avenue North, Fort Dodge, Ia. Telephone 2-1011.

202 Pr. 19—P.L.&J. Cable
11 Pr. 22—P.L.&J. Cable
.080—40% Copperweld Wire
Hemingray No. 10-16-19 Glass Insulators
2⅛" Porcelain Spool Insulators
Lag Screw Insulators
½ x 3½ Lag Screws
1¼ x 8 Wood Pins
½ x 9¼ W.U. Galv. Pins
4-inch 3-bolt Guy Clamps
2 x 2 Galv. Washers
¾" insulated Staples
All items at a fraction of market cost.
GILMOUR SALES CO. (Davis 2-4860)
169 - 1st Salt Lake City, Utah

65 LEICH 901 telephones—$12.00 each
15 Stromberg-Carlson 1248 telephones $10.00 each
15 Federal telephones 804A—$8.00 each
8 W. E. operators head sets 52AW—$8.00 each
90 feet 91-B switchboard cable 100-pair, 3—30 ft. pieces, like new—$50.00
Prices F.O.B. Holyoke, Colorado. All equipment in good working order when cutover to dial.
Write Phillips County Telephone Co., Holyoke, Colo.



**RECONDITIONED**
**WESTERN ELECTRIC #98A**

**Station protectors, complete with two No. 11C fuses, Two No. 26 and Two No. 27 protector blocks**

**Price.....$ .75 each**
**Lots of 100.....$ .70 each**
**Lots of 500.....$ .65 each**

**RECONDITIONED**
**FEDERAL #804A**

**Magneto Compact set convertible to desk or wall. Equipped with capsule type transmitter and receiver. Can be used on long rural lines.**
**Shipped complete with terminal block and refinished battery box.**

**PRICE $18.50 EACH**
**12 or more—$18.00**
***Terms 2%—10 Days Net: 30***

**BOHNSACK EQUIPMENT CO.**
**GERMANTOWN, NEW YORK**

**NEOPRENE JACKETED**
**TELEPHONE CABLE**
**19AWG/5 Pair, Solid**
**1000 Ft. Reels**
**$60.00 M FOB**
**WILLIAM CERESKE COMPANY**
**468 Second Street**
**Oakland 7, California**

**CABLE BREATHERS**
**PROVIDE MAXIMUM CIRCUIT SECURITY WITH THE LOWEST OPERATING EXPENSE**
**CABLE BREATHER CORP.**
**P.O. Box 148, Kansas City, Kansas**

**SPECIFY**
**TELERING**
**for**
**Dependable and Economical Telephone Ringing Power Equipment.**
**Engineered for complete satisfaction.**
***Manufactured by***
**TELKOR, INC. Elyria, Ohio**

**What You Want**
**When You Want It**
**Immediate Shipment from Nearest Warehouse Points**
**TELEPHONE & POWER SUPPLY, INC.**
**TOPEKA, KANSAS PHONE 4-8788**

# W.E. SWITCHBOARD SUPPLIES
## new & slightly used

| | |
|---|---|
| **#310 Plugs** on Cords (6 or 8 ft.) like-new gauged | $ 1.00 |
| as above on NYLON cords gauged | 1.50 |
| **#141 Jacks** on #112 Mtg. (double cut-off) good used | 5.00 |
| —many others available— | |
| **#12 Lamp** sockets on #137 Mtg. with lamps (24v) & caps | 5.00 |
| good used, specify cap type | |
| —many others— | |
| **Relays** E5 line relay, new, original carton | 2.00 |
| good used, on 20 per mtg | 20.00 |
| —hundreds of others— | |
| **Condensers** #139A, 2 mf. new | .75 |
| #137B, 1.25 mf., new | .60 |
| (16) #137B in can (60B) new | 7.50 |
| —many others— | |
| **Repeating Coils** #94A, cord circuit type new | 2.00 |
| (10 on 19" rack mtg.) new | 20.00 |
| 91A & 93A, phantom type, new | 10.00 |
| 27A, cord circuit type, new | 3.00 |
| 75A, phantom type, matched for rep | 6.00 |
| galv. pole mtg. for 75A | 2.50 |
| #84A, 5 pr. prot. for above mtg | 1.00 |
| 70A large single phantom type, new | 5.00 |
| —many others—all mfg.— | |
| **PBX Switchboards,** #551A, 40 line, reconditioned | 400.00 |
| 551B, 100 line relays, rebuilt | 750.00 |
| many others, equipped | |
| 550B 80 line relays, reconditioned | 400.00 |
| many others, from | 200.00 |
| **Cordless** 506, 7 CB lines, 3 trunks, reconditioned | 100.00 |
| 506B, 12 CB lines, 5 trunks, reconditioned | 150.00 |
| —special types CB & LB trunks— | |
| —shipped on approval— | |

# Telectric Co.

**1218 Venice Blvd. Richmond 8-2249 Los Angeles 6, Calif.**

# Stewart

## TEST EQUIPMENT

**Locates Line Trouble FAST**

MODEL A—Locator-Tester

MODEL D-1—Midget Detecto-Meter

MODEL E—Exploring Coil Amplifier

MODEL G
—Dual Electrolysis Voltmeter

MODEL H—Lineman's Test Set

MODEL J—Transistor Oscillator

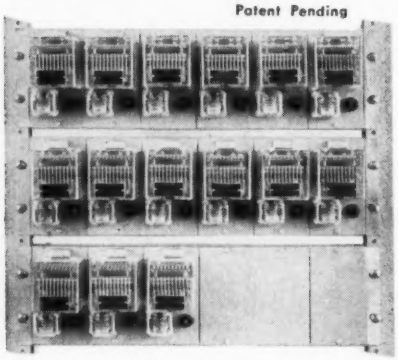
MODEL L—Cable Tester

**STEWART BROTHERS**
Division of Instrument Laboratories
Chicago 10, Illinois

---

# NEW
## CODE-TO-SELECTIVE RINGING CONVERTER

Patent Pending



Furnishes full, ten-party selective ringing on multi-party lines. Use with present switchboard and line equipment. Existing equipment does not require modification . . . fits any standard rack. Factory wired for quick installation. Flexible for future growth.

*ASK FOR BULLETIN NO. 554*

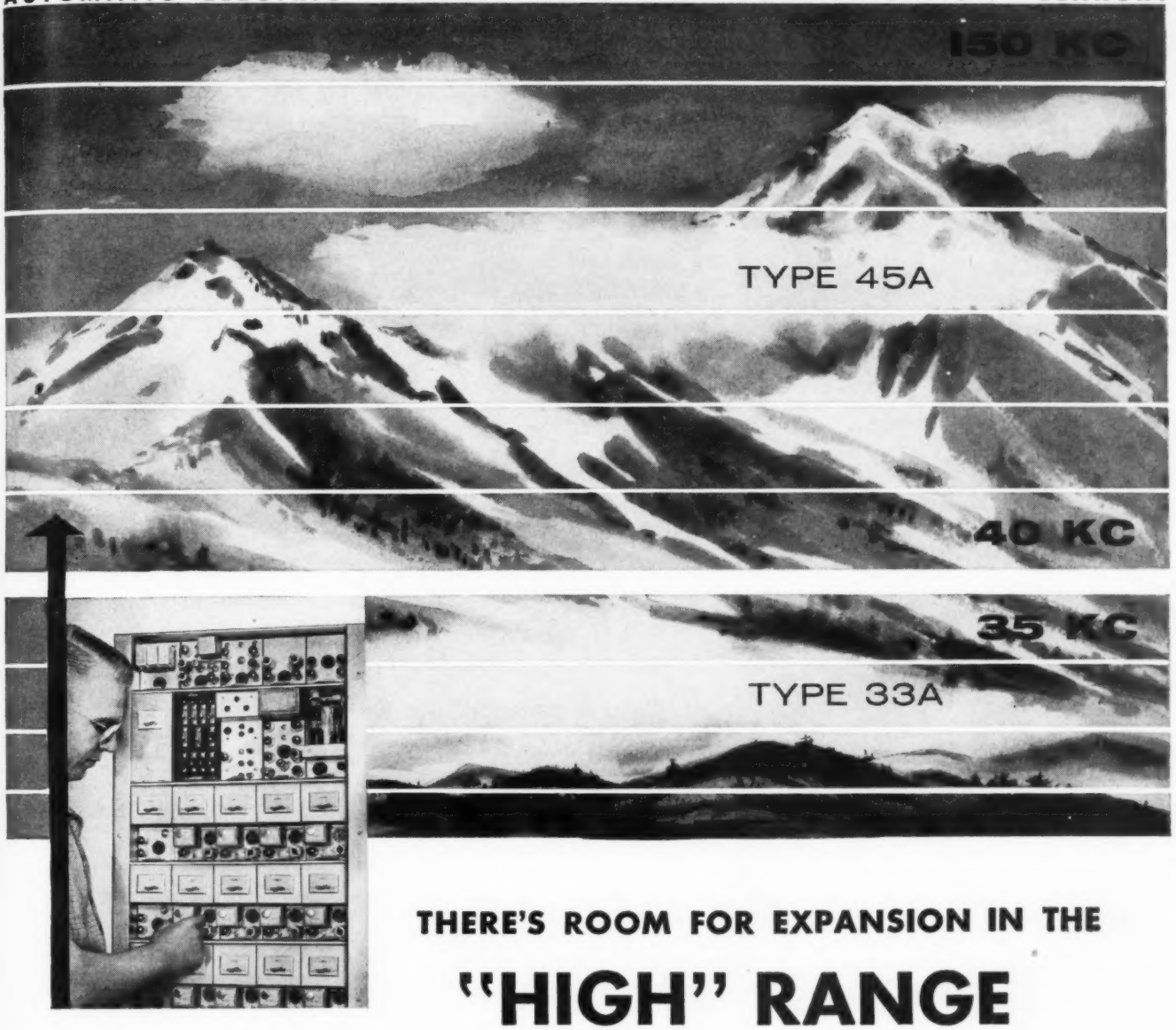
Universal Controls also manufactures Digit Absorbers and Computer Intercepts.

**UNIVERSAL**
**CONTROLS CORPORATION**
P. O. BOX 13122 • DALLAS 20, TEXAS


# Index to ADVERTISERS


| | Page |
|---|---|
| Acme Visible Records, Inc. | 21 |
| Alphaduct Wire & Cable Co., The | 53 |
| Aluminum Company of America | — |
| American Appraisal Company, The | — |
| American Chain & Cable Co., The Page Steel & Wire Div. | 55 |
| American Creosoting Corporation | — |
| American Steel & Wire Co. | 27 |
| American Telephone & Telegraph Co. | — |
| Anaconda Wire & Cable Co. | — |
| Ansonia Wire & Cable Co., The | — |
| Armstrong Cork Co., Glass Insulator | — |
| Arrow Fastener Co., Inc. | 31 |
| Atlantic Creosoting Co., The | 59 |
| Automatic Electric Sales Co. | 12-13, 32-33, 63 |
| Bakelite Company | — |
| Baker Wood Preserving Co. | 59 |
| Bartlett Tree Experts | — |
| Bashlin Company, W. M. | — |
| Bell Telephone Laboratories, Inc. | 39 |
| Benner-Newman, Inc. | — |
| Berry & Co., L. M. | — |
| Bethlehem Steel Co. | — |
| Blaw-Knox Company | — |
| Bohnsack Equipment Co. | 61 |
| British Insulated Callenders' Cables, Ltd. | 43 |
| Buchman Materials Co. | 55 |
| Buckeye Telephone & Supply Co. | 51, 60 |
| Burgess Manning Company | — |
| Burroughs Corp. | — |
| C&D Batteries, Inc. | 57 |
| Cabaniss-Pogue Company | 58 |
| Cable Breather Corp. | 61 |
| Cable Spinning Equipment Co. | — |
| Calculagraph Company | — |
| Chance Co., A. B. | — |
| Chase Brass & Copper Co. | — |
| Cleverly Electrical Works, The | — |
| Coffing Hoist Div. | 54 |
| Collins Radio Co. | — |
| Commercial Cord and Supply Co. | 55 |
| Cook Electric Company | — |
| Copperweld Steel Co. | — |
| Crane, Inc., Carl C. | 58 |
| Cullom & Ghertner | — |
| Davis Construction Co. | 59 |
| Donnelley & Sons, R. R. | — |
| Dow Chemical Co., The | — |
| Du Pont de Nemours & Co., E. I. | — |
| Duo-Safety Ladder Corp. | — |
| Eastman Chemical Products, Inc. | — |
| Electric Specialty Co. | 35 |
| Everstick Anchor Co. | — |
| Exide Industrial Division—The Electric Storage Battery Co. | — |
| Fisher Research Laboratories | 50 |
| Fitchburg Engineering Corp. | 37 |
| Foley Constr. Co., Robert E. | 59 |
| Four Wheel Drive Auto Co., The | 5 |
| General Cable Corporation | — |
| General Insulated Wire Works, Inc. | — |
| General Machine Products Co., Inc. | 46 |
| General Telephone Directory Co. | — |
| Gould-National Batteries, Inc. | — |
| Graybar Electric Co. | — |
| Greenlee Tool Co. | — |
| Haley & Co., R. G. | — |
| Harris-McBurney Company | — |
| Henkels & McCoy | 59 |
| Heywood, T. A. | 59 |
| Highway Trailer Company | — |
| Hirsch Organization, Inc., Gustav | — |
| Holan Corporation, J. H. | — |
| Homelite Corp. | — |
| Indiana Steel & Wire Co. | — |
| Industrol Corporation | — |
| International Business Machines Corp. | — |
| International Harvester Co. | — |
| Irwin Auger Bit Co. | — |
| Johns-Manville | — |
| Katolight Corp. | — |
| Kearney Co., Jas. P. | — |
| Kellogg Switchboard & Supply Co. | 6-7, 40-41 |
| Klein & Sons, Mathias | 48 |
| Koiled Kords, Inc. | — |
| Koppers Co., Inc. | — |
| Leich Sales Corporation | 10-11 |
| Line Material Co. | — |
| Lindsay Telephone Supply Co. | 52 |
| Lorain Products Corp., The | — |
| Magnolia Chemical Company, Inc. | — |
| McCabe-Powers Auto Body Co. | — |
| McFarland Company, L. D. | 58 |
| McGrath Engineers, Inc. | 58 |
| Midwest Electronics Supplies | — |
| Monsanto Chemical Co. | — |
| Morton Contracting Co. | — |
| Murphy Engineering Laboratories | — |
| National Carbon Co. | — |
| Natco Corporation | — |
| National Pole & Treating Div. | 59 |
| National Telephone Supply Co. | 64 |
| Neale Construction Co. | 59 |
| North Electric Company | 14-15 |
| Onan & Sons, D. W. | — |
| Orangeburg Manufacturing Co., Inc. | — |
| Osmose Wood Preserving Co. | 50 |
| Overton Co., S. E. | — |
| Owens-Illinois | — |
| Page & Hill, Inc. | 56 |
| Philco Corp., Gov't & Industrial Div. | — |
| Plastic Wire & Cable Corp. | — |
| Porcelain Products, Inc. | — |
| Prewitt & Sons, Inc., J. R. | — |
| Porter, Inc., H. K. | 42 |
| Preformed Line Products Co. | 16 |
| Radio Engineering Products Limited | 47 |
| Raytheon Mfg. Co. | — |
| Recordak Corp. | — |
| Reliable Electric Co. | — |
| Remington Rand Div. | 23 |
| Republic Creosoting Co. | — |
| Rex Corporation, The | — |
| Reynolds Metals Company | — |
| Roebling's Sons Corp., John A. | — |
| Rolatape, Inc. | — |
| Runzel Cord & Wire Co. | — |
| S&G Manufacturing Corp. | — |
| Schauer Mfg. Co. | — |
| Sequoia Process Corp. | — |
| Seymour Smith & Sons, Inc. | — |
| Sierra Electronic Corp. | — |
| Sloan, Cook & Lowe Co. | 59 |
| Soapstone Duct Co. | — |
| Stahl Metal Products Co. | — |
| Stewart Bros. | 62 |
| Stewart-Warner Corp., Electronics Div. | — |
| Stromberg-Carlson Co. | 2-3, 25, 44-45, 59 |
| Superior Cable Corporation | 29 |
| Suttle Equipment Co. | 59 |
| Taylor-Colquitt Co., The | — |
| Telectric Co., The | 61 |
| T.E.I. Corp. | 59 |
| Tel-E-Lect Products, Inc. | — |
| Telephone & Power Supply Co. | 61 |
| Teletype Corp. | 49 |
| Tele-Wire Supply Co., Inc. | — |
| Telkor, Inc. | 61 |
| Templeton, Kenly & Co. | — |
| Tudor & Yager, Inc. | 59 |
| United States Independent Telephone Association | — |
| United States Steel Corp. American Steel & Wire Co. | 27 |
| Coal Chemical Div. | — |
| Universal Control Corp. | 62 |
| Utility Equipment Co. | — |
| Warn Mfg. Co. | — |
| Weikel Line Company | 59 |
| Western Electric Co. | — |
| Wheelock Signals, Inc. | — |
| Whitney Blake Co. | 8-9 |
| Williams Inspection Co., A. W. | 59 |
| Willys Motors, Inc. | — |
| Wiremold Co., The | — |
| Wyoming Valley Equipment Div. | 59 |
| Yankee Tools—a division of Stanley Tools | — |
| Yates Construction Co. | 59 |
| York-Hoover Corporation | — |

AUTOMATIC ELECTRIC — LEADERS IN CARRIER COMMUNICATION — LENKURT




## THERE'S ROOM FOR EXPANSION IN THE

# "HIGH" RANGE

*A Lenkurt 45A Carrier System* is your next logical step if you need to expand beyond the capacity of your present low-frequency carrier. Using Type 45A, you can add up to 12 channels above existing low-frequency systems. It's easy, quick, and inexpensive—and frequently requires no additional carrier transpositions.

Lenkurt's "carrier interconnection" concept—foundation of the 45 "universal" class of carrier systems—provides interconnection *at carrier frequencies*. Open-wire, cable, and radio systems can all be joined in one network, without expensive back-to-back equipment arrangements normally necessary.

Lenkurt Type 45A carrier also offers these advantages:

- *proves in over distances less than 15 miles in competition with new open-wire construction*
- *meets performance standards for long-haul systems*
- *coordinates with other long-haul systems*
- *convenient miniaturized components — plug-in sub-assemblies — simplified maintenance*

If you need high-frequency carrier, investigate Lenkurt Type 45A open-wire carrier. Write today for complete information. *Address:* Automatic Electric Sales Corporation, 1033 West Van Buren St. (HAymarket 1-4300), Chicago 7, Illinois. *In Canada:* Automatic Electric Sales (Canada) Ltd., Toronto. *Offices in principal cities.*

AUTOMATIC ELECTRIC

*Originators of the dial telephone • Pioneers in automatic control*

GENERAL SYSTEM INDEPENDENT

# Nicopress®

# The Tool and the Sleeve

***that are made to work together***

## together

## they make the perfect splice

**The National Telephone Supply Company**

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

*Canadian Mfr.*—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

*Export Distributor*—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

*Nicopress* is the Registered Trade Mark of The National Telephone Supply Company

FEB 15 1957